RAILROAD GAZETTE

SATURDAY, AUGUST 7, 1875.

Contributions.

SAFETY-VALVES.

BY RICHARD H. BUEL.

[*Continued from page* 313.]

III. Proper Diameter for a Safety-Valve.

There are seven rules, commonly quoted by different authorities, for determining the area of a safety-valve. They are given below, with an example to illustrate their use:

Let

G=square feet of grate surface in boiler.
H= " " " heating " " "
C=pounds of coal burned per hour.
W= " " water evaporated per hour.
P=pressure of steam, as shown by gauge.
A=area of safety-valve in square inches.

When the area is known, the diameter of the valve can be found by dividing the area by the number 0.7854, and extracting the square root of the quotient.

1. *United States Rule.*—Allow one square inch of area in the valve for 25 square feet of heating surface in the boiler, or

$$A=\frac{H}{25}$$

2. *English Rule.*—For boilers with natural draft, allow half a square inch of area in the valve for each square foot of grate surface, or

$$A=\frac{G}{2}$$

1. *French Rule.*—1. Multiply the grate surface by the number 22.5.

2. Add the number 8.62 to the steam pressure.

3. Divide the first quantity by the second. The quotient will be the area of valve, or

$$A=\frac{G\times 22.5}{P+8.62}$$

4. *Molesworth's Rule.*—Allow a valve area of eight-tenths of an inch for each square foot of grate surface, or

$$A=G\times 0.8.$$

5. *Professor Thurston's First Rule.*—1. Multiply the pounds of coal burned per hour by the number 4.

2. Add the number 10 to the steam pressure.

Divide the first quantity by the second, or,

$$A=\frac{4\,C}{P+10}$$

6. *Professor Thurston's Second Rule.*—1. Multiply the heating surface by the number 5.

2. Add the number 10 to the steam pressure, and multiply the sum by the number 2.

Divide the first quantity by the second, or,

$$A=\frac{5\,H}{2\,P+20}$$

7. *Professor Rankine's Rule.*—Allow a valve area of six-thousandths of an inch for each pound of water evaporated per hour, or,

$$A=0.006\,W$$

In many cases these rules give widely different results, as will be illustrated by their application to an example.

It is required to find the area of a safety-valve for a boiler having 15 square feet of grate surface, 472.5 square feet of heating surface, carrying 40 pounds of steam, burning 210 pounds of coal, and evaporating 1,470 pounds of water per hour.

1. *United States Rule:*

472.5÷25=18.9 square inches=area required.

2. *English Rule:*

15÷2=7.5 square inches=area required.

3. *French Rule:*

40+8.62=48.62.
15×22.5=337.5.
337.5÷48.62=6.94 square inches=area required.

4. *Molesworth's Rule:*

15×0.8=12 square inches=area required.

5. *Professor Thurston's First Rule:*

40÷10=50.
210×4=840.
840÷50=16.8 square inches=area required.

6. *Professor Thurston's Second Rule:*

40+10=50.
50×2=100.
472.5×5=2,362.5.
2,362.5÷100=23.63 square inches=area required.

7. *Professor Rankine's Rule:*

1,470×0.006 in.=8.82 square inches=area required.

It is not remarkable that these rules should give such varying results, when it is remembered that the performance of different boilers of precisely the same dimensions varies greatly. A safety-valve should have such proportions that it can permit all the steam to escape that a boiler can generate when forced to the utmost extent. Hence its area depends upon:

1. *The amount of steam to be discharged in a given time.*
2. *The lift of the valve.*
3. *The velocity with which the steam escapes.*

There is such a difference in the amount of coal burned per square foot of grate per hour in different boilers, and the amount of water evaporated per pound of coal, that it would seem impossible to use the same constants in a formula for all cases. It is believed, however, that the following estimates give a most liberal allowance on the side of safety:

	Pounds of coal burned per square foot of grate per hour.	Pounds of water evaporated per pound of coal.
Stationary and marine boilers with natural draft	15	9
Stationary and marine boilers with forced draft	30	7
Locomotive boilers	100	6

On these assumptions, the pounds of water evaporated, and consequently the weight of steam that the safety-valve would have to release per hour for each square foot of grate surface would be:

For stationary and marine boilers with natural draft	135
For stationary and marine boilers with forced draft	210
For locomotive boilers	600

These figures, as has been stated, represent much better than average performance, and can readily be modified to suit any particular case. Of course, in constructing a formula for general use, in the absence of precise data, and in view of the varying results obtained from boilers of the same kind, the estimate should be taken high enough to include all cases. One element of the proposed formula for the diameter of a safety-valve for any given boiler, then, will be the number of square feet of grate surface in the boiler, multiplied by a constant.

The amount of opening afforded by a safety-valve for the escape of steam depends not only on its diameter, but also on the distance that the valve lifts. In order that the area for escape shall be equal to the area of the valve, it is necessary that the left should be one-quarter of the diameter of the valve. A valve without bevel, Fig. 10, evidently gives an opening, when raised, equal to the surface of a cylinder having the same diameter as that of the valve $a\,b$, and a height equal to the lift, $c\,b$. *Hence the rule for finding the opening of a flat valve, due to a given lift, will be as follows:* multiply the diameter of the valve by the lift, and by the number 3.1416.

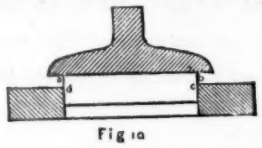


Fig 10

Example.—A flat valve 3 inches in diameter lifts 1-16 of an inch. What is the area of the opening?

Lift	0.0625
Multiply by	3 1416
	0.196+
Multiply by	3
Area of opening in square inches	0.589+

If the valve has a bevel, as shown in Fig. 11, until it lifts clear of the seat the opening will be equal to the surface of the frustum of a cone, of which the upper base has the same diameter, $a\,b$, as the valve, the slant height, $b\,e$, is the perpendicular

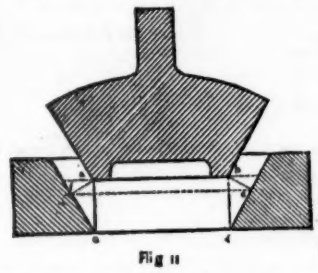


Fig 11

distance between the lower edge of the valve and the seat, and the diameter of the lower base, $f\,e$, is the diameter of the seat, measured at the intersection of perpendiculars $b\,e$, $a\,f$, from opposite points of the lower edge of the valve to the seat. The bevel or inclination of the valve is the angle of inclination to a vertical line, $f\,c\,a$, or $e\,d\,b$.

To find the amount of opening afforded by a valve with beveled seat for any lift less than the depth of the seat.

(1). Multiply the diameter of the valve by the lift, by the sine of the angle of inclination, and by the number 3.1416.

(2). Multiply the square of the lift by the square of the sine of the angle of inclination, by the cosine of this angle, and by the number 3.1416.

Add these two products.

Example.—The diameter of a safety-valve is 2½ inches, the seat is ⅜ of an inch deep, and has a bevel of 25 degrees. What is the area of opening, for a lift of ¼ of an inch?

Sine of 25°	0.423
Multiply by lift	0.25
	0.106—
Multiply by	3.1416
	0.333
Multiply by diameter of valve	2.5
1st Product	0. 83+
Square of sine of 25°	0.179
Multiply by cosine of 25°	0.906
	0.162+
Multiply by square of lift	0.0625
	0.0101+
Multiply by	3.1416
2nd product	0.03+
Add 1st product	0.83+
Area of opening in square inches	0.86+

It often happens that the depth of the bevel is very slight, so that the valve lifts clear of the seat. In such a case the opening must be computed for a beveled valve with a lift equal to the depth of the seat, and for a flat valve with the remainder of the lift.

Example.—The diameter of a valve is 4 inches, the bevel is 35°, and the depth of seat ¼ of an inch. What is the area of opening for a lift of ⅜ of an inch? First calculate the area of opening for a beveled valve, with a lift of ¼ inch, the depth of the seat.

Sine of 35°	0.574
Multiply by	3.1416
	1.8
Multiply by lift	0.25
	0.45
Multiply by diameter of valve	4
First product	1.80
Square of sine of 35°	0.329
Multiply by cosine of 35°	0.819
	0.269
Multiply by	3.1416
	0.85
Multiply by square of lift	0.141
Second product	0.12
Add first product	1,80
Area of opening, in lifting clear of seat, in square inches	1.92

Next calculate the amount of opening due to the lift above the seat, which in this case is ⅛ of an inch:

Lift	0.125
Multiply by	3.1416
	0.3927
Multiply by diameter of valve	4
Area of opening due to lift above seat, in square inches	1.57
Add opening due to lifting clear of seat	1.92
Total area of opening, in square inches	3.49

It will be observed in most of the examples that have been given that the operations are not carried out to many places of decimals, as they are inserted merely for sake of illustration.

[To be continued.]

Scraper Work.

To the Editor of the Railroad Gazette:

By the majority of persons interested in the above title, the following will probably be considered too theoretical. But theory, in some form, must of necessity precede all practice, and our data not being procurable to a nice point is no reason that our method should not be exact, or that we should not reach conclusions, by approximating one practice to which we may naturally expect the best results, at any rate better than by simple guess-work.

Scraper work as compared with the same work by wagons, as conducted on our Northwestern railroads, is, I think, generally underrated.

We will assume two facts which, if necessary, could be very readily proved, viz.: That for very short distances material moved by scrapers costs less than when moved in wagons, and that for long distances the converse is true. From which we conclude that the maximum economical haul for scrapers is reached when the cost equals that of the same haul in wagons:

Let

p=Price of teams per day.
a=Number of scraper loads in one cubic yard.
d=Total distance traveled by teams in one day.
x=Length of haul.

Then

$\frac{d}{2\,x}$ = Number of trips in one day.

$\frac{d}{2\,x}\cdot\frac{d}{a}=\frac{d}{2\,x\,a}$ = Number of yards moved.

$\frac{d}{2\,x\,a}\cdot p=\frac{2\,a\,x\,p}{d}$ = Cost per cubic yard moved by scrapers.

To obtain the cost by wagons, we will introduce the following new quantities:

s = Number of shovelers, including dumpers.
p' = Wages of shovelers.
n = Number of loads per day; one day's time of loading.
a' = Number of cubic yards in one wagon.

The other quantities remaining the same.

$2\,x\,n$ = Sum of distances traveled by all the teams.

$\frac{2\,x\,n}{d}$ = Number of wagons employed.

$\frac{2\,x\,n\,p}{d}$ = Total cost of wagons per day.

$p's$ = Total cost of loading and unloading.

$n\,a'$ = Number of yards moved.

$\frac{2\,x\,n\,p}{d+p's}$ = Cost per cubic yard when moved in wagons.

Placing the two costs equal as before explained:

$$\frac{2\,a\,x\,p}{d}=\frac{\frac{2\,x\,n\,p}{d+p's}}{n\,a}$$

$$2\,x\,a\,p\,n\,a'=2\,x\,n\,p+p's\,d$$

$$x=\frac{p's\,d}{2\,a\,p\,n\,a'-2\,n\,p}=\frac{p's\,d}{2\,p\,n\,(a\,a'-1)}.$$

Which is the greatest economical haul for scrapers and least for wagons.

It will be observed that no allowance is made for a "scraper-holder."

This is usually a very small quantity and can be readily introduced, but, by experienced contractors is generally dispensed with, except where the demand for teams considerably exceeds the supply, making the teamsters independent, when they will not hold their own scrapers.

For the benefit of persons not versed in algebra, we will substitute the following: p = $4.00; a = 7; d = 20 miles = 10,560 feet; s = 9; p' = $1.50; n = 150; a' = 1.

The maximum economical haul will then be 198 feet, varying directly with the wages of the hands and inversely with that of the teams, though not entirely dependent on these quantities.

Signal System for the Railroads of Germany.

In accordance with Articles 42 and 43 of the Imperial Constitution, and in connection with the Road Police Regulations for the German Railroads published by announcement of the same date, the Confederation Council of the German Empire has published the Signal System for the Railroads of Germany, under date of Jan. 4 of this year, which we translate as follows :

I. SIGNALS ON THE OPEN ROAD.

a. The acoustic signals for track workmen and watchmen are to be given as follows by means of electric bells :

1. The train runs in the direction from A to B (Notice signal).	A fixed number of bell strokes *once*.
2. The train runs in the direction from B to A (N tice signal).	The same number of bell strokes *twice*.
3. The road must not be run over until the train is due by time table (Rest signal).	The same number of bell strokes *three times*.
4. Something extraordinary is to be expected (Alarm signal).	The same number of bell strokes six times.

Besides the electro-acoustic signals, horn signals will be given as follows :

Signal 1: A long, a short, a short and a long sound, given once.
" 2: The foregoing signal, given twice.
" 3: A long, a long, a long, and a long sound.
" 4: A short, a short, a short, and a short sound, given twice.

b. The *optical signals* are to be given as follows :

	BY DAY.	BY NIGHT.
5. The train can run without hindrance (Trip signal).	The track-guard fronts towards the train.	The track-guard fronts towards the train and holds his hand lantern with a *white* light in the direction of the train.
6. The train should run slowly.	The trackman holds any object whatever in the direction of the track.	The trackman holds the hand lantern with a *green* light in the direction of the train.
	Disks are to be placed at the beginning and the end of a section which is to be run over slowly. The face of the first disk which is towards approaching trains must be designated by "A," the last one with "E."	At the beginning and end of a section which is to be run over slowly lanterns on stakes must be placed. The first lantern must show a *green* light towards an approaching train, the last one a *white* light.
7. The train should stop (Halt signal).	The trackman swings any object back and forth.	The trackman swings back and forth his hand lantern, which, if time permits, should be one showing a *red* light.

Besides signals 5 to 7, signals can also be given by the semaphore as follows :

Signal 5: The train can pass without hindrances.	Right-hand semaphore arm inclined upward (at an angle of about 45 degrees).	*White* light in the signal lantern of the semaphore.
Signal 6: The train should run slowly.	Besides the signal previously described, a staff with a round disk attached to the semaphore mast.	*Green* light in the signal lantern of the semaphore.
Signal 7: The train should stop (Halt signal).	Right-hand telegraph arm placed horizontal.	*Red* light in the signal lantern of the semaphore.

The optical signals at the block telegraph stations, which in the position of rest must indicate "stop," are to be given as follows :

8. Road clear.	Right-hand semaphore arm inclined upward (at an angle of about 45 degrees).	*White* light in the signal lantern.
9. Stop.	Right-hand telegraph arm horizontal.	*Red* light in the signal lantern.

II. SIGNALS AT AND IN FRONT OF STATIONS.

a. The acoustic signals with the station bell.

10. The train is about to depart; there is time to get aboard.	A short ringing and one clearly defined stroke.
11. All aboard.	Two sharp strokes.
12. Start.	Three sharp strokes.

b. The optical signals on the semaphores at the extremities of the station yard are as follows :

	BY DAYLIGHT.	WHEN DARK.
13. Entrance is blocked.	The semaphore arm on the right must be horizontal.	The signal lantern on the semaphore shows a *red* light *outward* and a *green* light inward (toward the station).
14. Entrance is clear.	The semaphore arm on the right must be inclined upwards (at an angle of about 45 degrees).	The signal lantern on the semaphore shows a *green* light *outward* and a *red* light inward (toward the station).

15. At a distance of 1,000 to 330 feet in front of the semaphores at extremities of station yards an *outer signal* is to be placed, if required by the inspecting official, with automatic connection with the first signal. The same shall consist of a round disk turning on an axis, with a lantern placed in the middle.

If the station semaphore displays the signal "Entrance is blocked," the full round disk standing vertical, and when dark the lantern situated in its middle with a *green* light, is turned towards the approaching train, while if the signal on the station semaphore indicates "Entrance is clear," the disk lies horizontal, or stands parallel to the line of the track—the lantern shows a white light.

c. The *optical signals* on the station platform semaphore will be given as follows :

	BY DAYLIGHT.	WHEN DARK.
A train permitted to enter or pass through should stop.	Right-hand arm of the platform semaphore placed horizontal.	*Red* light in the signal lamp of the platform semaphore.
The train may enter.	Right-hand arm of the platform semaphore inclined upward (at an angle of about 45 degrees).	*Green* light in the signal lamp of the platform semaphore.

d. The optical signals on the water cranes.

The discharge pipe of the water cran eis to be provided with a lantern when dark.

	BY DAYLIGHT.	WHEN DARK.
16. The discharge pipe of the water crane leaves the passage clear.	The discharge pipe stands parallel to the direction of the track.	*White* light in the lantern placed on the discharge pipe of the water crane.
17. The discharge pipe of the water crane obstructs the passage.	The discharge pipe stands at right-angles to the direction of the track.	*Red* light in the lantern placed on the discharge pipe of the water crane.

III. SIGNALS ON THE TRAIN.

For optical signals on the train the following rules are to be observed ;

	BY DAYLIGHT.	WHEN DARK.
18. Indication of the head of train:		
a. When the train runs on a single-track road, or on the track of a double-track road designated for the direction it is running;	No special indication.	Two lamps with *white* lights in front of the locomotive.
b. When the train is running exceptionally on that track of a double-track road *not* designated for the direction it is running.	No special indication.	Two lanterns with *red* lights in front of the locomotive. If, in exceptional cases, the locomotive should not be at the head of the train, or should be running with the truck in front, then the lanterns are to be placed on the front part of the front vehicle.
19. Indication of the tail of train. (Tail signal).	On the back end of the last car a *red* and *white* round disc.	On the back end of the last car two lamps showing *green* in front and *red* behind. For locomotives running alone a lantern with a *red* light is sufficient, and for the movement of locomotives at stations the attachment of a lantern with a white light in front of the locomotive and on the end of the tender, and, in case of tank locomotives, on both its ends.
20. An extra train is following.	Besides the tail signal a green disc above the back end of the last car, or on each side of it.	Signal 19, with this difference, that one of the lanterns described in it also shows a *green* light backwards. For locomotives running alone the attachment of a lamp throwing a green light backward is sufficient.
21. An extra train is coming in the opposite direction.	A *green* round disc on the front of the locomotive.	A lantern with a *green* light above the lantern with a white light in front of the locomotive.
22. The telegraph wire is to be examined.	A *white* round disc on the front of the locomotive.	No special signal.
23. The track-man should immediately go over his section of track.	A train-man swings his cap or any other object in the direction of the trackman.	A train-man swings his lantern in the direction of the track-man.

IV. SIGNALS OF THE TRAIN CREW.

a. With the steam whistle:

24. Pay attention (Warning signal).	A moderately-long whistle, ——.
25. Put on brakes.	Three short whistles, following each other quickly, — — —.
26. Let off brakes.	Two moderately-long whistles, following each other quickly, —— ——.

b. With the mouth whistle:

27. The train-men should take their place.	A moderately-long whistle, ——.
28. Start.	Two moderately-long whistles, —— ——.

V. SWITCHING SIGNALS.

a. Acoustic, with the mouth whistle or the horn, are to be given as follows :

Draw forwards.	A long whistle or sound, ——.
Push backwards.	Two moderately-long whistles or sounds, —— ——.
Stop.	Three short whistles or sounds, following quickly one after the other, — — —.

b. Optical, are to be given with the arm in the following manner :

	BY DAYLIGHT.	WHEN DARK.
Draw forward.	Vertical movement of the arm from above downward.	Vertical movement of the hand lamp from above downward.
Push backward.	Horizontal movement of the arm back and forth.	Horizontal movement of the hand lamp back and forth.
Stop.	Circular movement of the arm.	Circular movement of the hand lamp.

GENERAL RULES.

1. The preceding rules given for a train also apply to locomotives running alone, so far as exceptions are not admitted for the latter.

2. This signal system comes into force April 1, 1875, and applies to all railroads in Germany. Excepted from it are those railroads which are constructed with a gauge narrower than the standard, and also those for which an exception is considered permissible, on account of their subordinate position, by the officials of the country in which they may be, with the approval of the Imperial Railroad Bureau.

The same will be published in the "*Centralblatt*" for the German Engine, and also by the governments of the confederation.

The regulations for carrying out this system issued by the inspecting officials or the railroad managements are to be imparted to the Imperial Railroad Bureau.

3. So far as the introduction of the signal arrangements required by the foregoing rules is not to be effected on certain roads without special difficulties, suitable delays may be consented to for their completion by the respective governments, with consent of the Imperial Railroad Bureau. Requests to this effect will be received until March 1, 1875.

THE CHANCELLOR OF THE EMPIRE,
BERLIN, Jan. 4, 1875. PRINCE BISMARCK.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

Chicago & Lake Huron.—Mr. Stephen Tinker, late of the Eastern Division, has been appointed Master Mechanic of the Western (Peninsular) Division, in place of Wm. C. Faulkner, resigned.

Rutland.—At the annual meeting in Rutland, Vt., July 28, the following directors were chosen : John B. Page, John Prout, Rutland, Vt.; James W. Hickok, Burlington, Vt.; James H. Williams, Bellows Falls, Vt.; Edwin A. Birchard, Brandon, Vt.; Jacob Edwards, Peter Butler, William Sohier, James S. Whitney, Boston. The board subsequently re-elected John B. Page, President; B. Smalley, Clerk ; J. M. Haven, Treasurer.

Washington City, Virginia Midland & Great Southern.—Mr G. J. Foreacre is now General Manager. He is well known as Superintendent of the old Macon & Western road, now the Atlanta Division of the Central of Georgia.

California Central.—The following directors were recently chosen for the ensuing year : Reuben Morton, A. W. Bowman, A. J. Gunnison, A. A. Cohen, G. H. Howard, Thomas Hayes, Horace Davis, Calvin Paige, Michael Reese. The board elected Reuben Morton, President ; A. W. Bowman, Vice-President : A. J. Gunnison, Treasurer ; N. D. Arnot, Jr., Secretary.

Fort Wayne, Muncie & Cincinnati.—Mr. McPhail has been appointed Master Mechanic in place of Mr. George C. Watrous, resigned.

Petersburg.—The whole of the old board having resigned with President Ragland, a new board has been chosen, as follows : President, Isaac H. Carrington, Richmond, Va.; directors, R. G. Pegram, Petersburg, Va.; W. W. Gordon, W. K. Martin, John B. Davis, Richmond, Va. ; Hiram Sibley, Rochester, N. Y.

National Security & Improvement Company.—The officers of this newly organized company are as follows : President, H. H. Crumlish, Wilmington, Del.; Secretary, J. T. Griffith, Berryville, Va.; Treasurer, the Fidelity Trust Company, Philadelphia ; Directors, Thomas N. Ashby, Milton T. Fristoe, George W. Macatle, Front Royal, Va.; W. W. C. Wilson, Summit Point, W. Va.: E. J. McManus, Andrew Crumlish, Wilmington, Del.; W. H. Flynn, South Berwick, Me.

Utica, Ithaca & Elmira.—The new board of directors has re-elected the old officers as follows : W. L. Burt, President ; Joseph Rodbourn, Vice-President ; O. B. Curran, Secretary and Treasurer ; H. P. Goodrich, Superintendent ; F. W. Curran, Assistant Superintendent.

Flint & Pere Marquette.—At a meeting of the board of directors held July 7, the following officers were chosen : President, Jesse Hoyt, New York ; Vice-President, Samuel Farwell, Utica, N. Y.; Secretary, Treasurer and General Manager, Henry C. Potter, East Saginaw, Mich. ; Superintendent, Sanford Keeler, East Saginaw, Mich. Mr. Keeler was Assistant Superintendent.

Memphis & Little Rock.—Mr. R. K. Dow, who has been in possession of the road as agent for the trustees, has been appointed Receiver by the United States District Court. He has appointed the following officers : M. B. Prichard, General Manager, Little Rock, Ark.; J. D. Darden, Treasurer, Little Rock, Ark.; W. E. Smith, Superintendent, Memphis, Tenn.; J. H. Perry, General Ticket Agent, Memphis, Tenn.; R. S. Carnes, General Freight Agent, Memphis, Tenn.

Atchison, Topeka & Santa Fe.—Mr. W. F. White has been appointed General Ticket Agent, and T. J. Anderson, General Passenger Agent.

Wilmington, Columbia & Augusta.—Mr. N. M. Johnson has been appointed General Southeastern Agent for this road and the Charlotte, Columbia & Augusta. His office is at Charlotte, N. C.

Chicago, Danville & Vincennes.—The freight and ticket departments have been consolidated, and W. B. Williams, formerly General Freight Agent, has been appointed General Freight and Ticket Agent, relieving C. B. Mansfield, formerly General Ticket and Purchasing Agent.

Detroit, Hillsdale & Southwestern.—Mr. D. L. Quirk is President of this company, which succeeds the Detroit, Hillsdale & Indiana. Mr. Wm. F. Parker is Superintendent.

Erie.—Mr. George R. Blanchard, formerly Second Vice-President, has been appointed Assistant to the Receiver, his duties remaining the same as heretofore.

Fort Wayne, Jackson & Saginaw.—Mr. Wm. M. Hastings has been appointed Assistant General Manager; H. A. Raymond, Auditor; and W. B. Beamer, Master of Transportation, with headquarters at Jackson, Mich. Mr. Hastings will retain control of the freight department as heretofore.

Poughkeepsie, Hartford & Boston.—The officers of this company, successor to the Poughkeepsie & Eastern, are as follows: G. P. Pelton, President; J. A. Perkins, Superintendent; A. Swain, Secretary; A. W. Cable, General Freight and Passenger Agent, Auditor, and Purchasing Agent. General offices, Poughkeepsie, N. Y.

Atlanta & West Point.—Mr. John P. King was re-elected President, at the annual meeting in Atlanta, Ga., July 24.

Canadian Pacific.—Mr. Walter Shanly, late contractor on the Hoosac Tunnel, has been appointed Consulting Engineer for the Georgian Bay Branch and the Canada Central Extension.

Canada Southern.—At the annual meeting in St. Thomas Ont., recently, the following directors were chosen: W. A Thomson, Queenston, Ont.; P. L. Cable, Rock Island, Ill.; M

Courtright, W. L. Scott, Erie, Pa.; Sidney Dillon, David Dows, John Ross, David Stewart, E. A. Wickes, New York. The only new director is Mr. Stewart, who succeeds O. S. Chapman.

Grand Rapids & Indiana.—The names of John P. Green, Philadelphia, and Robert B. Potter, New York, were accidentally omitted from the list of directors given last week.

Pennsylvania & Erie Coal and Railroad Company.—This company was organized July 16, by the election of the following directors: H. G. Stebbins, Homer Ramsdell, E. M. Clymer, C. R. Early, A. McKinney, A. A. Marsh, Hewitt Saltonstall.

Queen Anne's & Kent.—The officers of this road are: B. T. Biggs, President; P. H. Irwin, Superintendent and Treasurer; J. E. Taylor, Secretary. General offices, Centreville, Md.

Richmond, York River & Chesapeake.—H. T. Douglas has been appointed Superintendent, *vice* Edward F. Folger, deceased.

Vicksburg, Shreveport & Texas.—Mr. Jos. F. McGuire has been appointed Cashier, in place of James H. Milling, appointed General Freight Agent.

Kansas Pacific.—J. W. Griffith has been appointed Fuel Agent, with office at Kansas City, Mo.

Kansas City Stock Yards.—Mr. L. V. Morse, late of the Atchison & Nebraska, has been appointed Superintendent.

Utica & Black River.—Mr. Edward Bond has been appointed Engineer in Charge of the extension to Morristown. His headquarters will be at Hammond, N. Y., for the present.

Middlesex Central.—At the annual meeting, July 31, the following directors were elected: Jacob Edwards, William H. Hill, Jr., J. V. Barron, Spencer W. Richardson, Nathan Cushing, Edward D. Adams, George Keyes. The road is leased to the Boston & Lowell.

Pittsburgh, Fort Wayne & Chicago.—Mr. W. A. Routson has been appointed Master of Transportation of the Eastern Division, in place of S. J. Williams, resigned. Mr. E. W. Parker has been appointed Master of Transportation of the New Castle & Beaver Valley and Lawrence branches, in place of W. A. Routson, promoted.

North Carolina.—The Governor of North Carolina has appointed the following State directors of the North Carolina Railroad Company: W. A. Smith, R. Barringer, John C. McDonald, S. H. Wiley, W. R. Albright, H. W. Fries, N. H. D. Wilson and R. F. Patterson.

THE SCRAP HEAP.

Centennial Excursion Cars.

The Harrisburgh (Pa.) *Patriot* says. "We learn that the Cumberland Valley Railroad is about having constructed a number of passenger cars in which seats will be numbered, and overhead there will be a receptable provided with lock and key for the baggage of the seat holder. The excursionist buys a ticket, and with it he receives a key and a check attached, and on the check he finds a number stamped corresponding with the number of the seat to which he is entitled. He will find the key to unlock the closet over his seat—but not the closet over any other seat. When he reaches Philadelphia he can lock up as much of his baggage as he chooses and sally forth. The train will be run upon a siding convenient to the centennial grounds. At any time the excursionist desires he can walk over to the train, unlock his closet and take out or put in anything he chooses. He may even put his lunch there. At night on the way home the check and key are taken up with the return ticket. The passenger is thus put at no inconvenience, but on the other hand is supplied with accommodation almost unknown to railway travelers at the present time.'

Railroad Manufactures.

The Cleveland (O.) Rolling Mill Company is erecting two Siemens-Martin furnaces of seven tons capacity each. The steel made by these furnaces is to be rolled into boiler plates.

The works of the New Castle Iron Company have been transferred to the new firm of J. B. Bradley & Co.

The Cincinnati, Hamilton & Dayton Company has contracted for 20 miles of new iron rails from the Indianapolis Rolling Mills, to be furnished at the rate of five miles per week. The mills are running full double turn.

The Sunbury (Pa.) Car Wheel Foundry is running steadily with large orders ahead. The wheels now being turned out are for the Empire Transportation Company.

Frederick & Co.'s car shops at Ferndale, Pa., were to start up last week, having received some orders.

The Ferndale Rolling Mills have shut down, probably for some time.

At the Palo Alto Rolling Mill and at Mount Carbon, Pa., anthracite coal dust is now used in heating furnaces in combination with bituminous coal—about 40 per cent. of the former to 60 of the latter.

The work on the buildings for the new steel mill at Beaver Falls, Pa., is rapidly progressing, and some of the machinery is already up.

The Cairo & Vincennes road recently received a new freight engine from the Baldwin Locomotive Works.

The Passaic Rolling Mill at Paterson, N. J., is running full double turn and employs about 350 men.

The Paterson Iron Company now employs about 200 men, much less than the usual force. The company has begun the manufacture of steel tires for locomotives.

The Grant Locomotive Works at Paterson, N. J., have shipped three out of the last ten engines of the Russian order.

The Barney & Smith Manufacturing Company at Dayton, O., recently turned out several passenger cars for the Buffalo & Jamestown road.

The *Iron Age* of last week says:

"From all the indications we think it safe to conclude that the reaction from extreme depression in the iron trade has already begun—though, it must be confessed, in a very small way. We rarely hear of furnaces blowing out; it is by no means rare to hear of them being blown in to meet an increased local demand for iron. Moreover, we see indications of a better feeling in the trade. The railroads are purchasing somewhat more liberally than for some months past, and the rail mills are anticipating larger orders as the season advances and the roads require to be put in condition for the winter traffic. The general consumptive demand does not seem to promise a very rapid increase between this and the end of the year, and it must be confessed that, if a better feeling does exists, it rests upon little besides the hope of future improvement in trade. At the same time, a majority of those in the trade with whom we have lately conversed seem to feel that the worst is past, and that any change must be a change for the better."

Experience with the Loughridge Brake.

The Piedmont (W. Va.) *Intelligencer*, of July 23, gives an account of a trip on the Cumberland & Pennsylvania Railroad on a train equipped with this brake, as follows:

"This invaluable brake is the invention of Mr. Wm. Loughridge, of Baltimore, and has been used by the Baltimore & Ohio Railroad for over a year past, with very beneficial results, both in saving human life and stock, as well as money to the company. The capacity of the brake, however, is not fully tested on the latter road, on which the grades are comparatively

Fig. 1

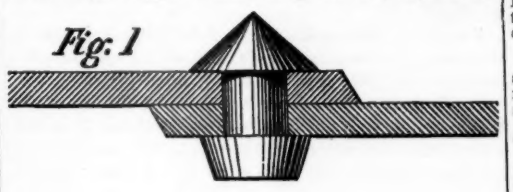
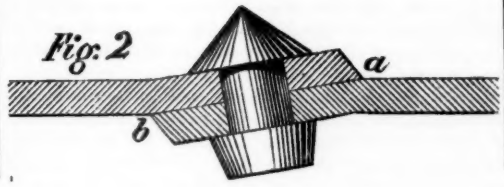


Fig. 2



light, and the experiment of putting them on the trains of the Cumberland & Pennsylvania road, on which some grades approximate 200 feet to the mile, was virtually 'taking the bull by the horns.' For instance, going down the grade to Mount Savage, which is at least 180 feet to the mile, the train was stopped on the hill side without the least perceptible jar. The brake is so arranged that should a coupling burst and thus leave the train beyond the control of the engineer, the hand brake has nearly double its former power, and the train is always under control. We arrived in Cumberland well satisfied that the brake was a grand triumph of mechanical skill, but on our return we had a few examples of its great necessity on this road. Having got permission we got on the engine at Frostburg to see how the engineer handled this, to him, new apparatus. Just below that town the engineer, Mr. Adam Johnson, discovered on rounding a curve, that there were some cattle on the track. We were then descending the grade at a speed of about 23 miles an hour. To our mind, it looked as if there would be a dead cow, a wrecked train, and an editor's funeral. But a slight movement of the engineer's left hand on a small lever, a little hiss of escaping air, and the train was going no faster than a baby can toddle. The cattle were driven from the track, and once more the train sped on its way. At every station the cars were halted just at the platform, without the toot-tooting of whistles heretofore heard."

The Pendergrast Steam Brake.

A new steam-brake has been patented by Mr. J. A. Pendergrast, who was formerly foreman at the Huntington machine shops of the Chesapeake & Ohio Railroad, which is thus described by a local paper: "The plan is simply a cylinder and piston underneath the tender, with a small steam-pipe communicating from one end of the cylinder with the boiler. The piston is connected with a ratchet, which operates by means of a cog-wheel, a barrel on which a chain is wound, connecting with all the brake-rods on the train. By letting the steam into the cylinder, the piston is driven out and operates the barrel, winding up the chain with an immense power and checking every wheel.

"Mr. Pendergrast has applied his brake to the cars on the East Kentucky Railroad, running from Riverton to Grayson. We saw letters from the Superintendent and Chief Engineer last week, who are delighted with it. They say it works admirably, and they can, if desired, slide every wheel.'

From the description it seems to be a modification of the Loughridge steam-brake, which, we believe, is not now in use.

Prizes to Enginemen.

The official list of premiums awarded to enginemen and firemen on the Western Division of the Pittsburgh, Fort Wayne & Chicago road for June is as follows:

Engine No. 223—Charles Miles, engineer; J. Q. McClellan, fireman. Premium on through passengers, $20 to engineer and $10 to fireman.

Engine No. 108—Thomas Dyer, engineer; C. R. Lawrence, fireman. Premium on local passengers; $20 to engineer and $10 to fireman.

Engine No. 113—Wm. T. Jackson, engineer; W. H. Gates, fireman. First premium on standard freight, $20 to engineer and $10 to fireman.

Engine No. 116—A. Johnson, engineer; M. Brennan, fireman. Second premium on standard freight, $15 to engineer and $7.50 to fireman.

Engine No. 183—P. Reilly, engineer; P. Rausch, fireman. Premium on other class engines, $20 to engineer and $15 to fireman.

"Passing" and "Crossing."

The train rules of the Eastern and Maine Central Railroads are prefixed by the explanation: "Trains 'cross' when they meet and go by each other; they 'pass' when one overtakes another and goes by it."

A Query.

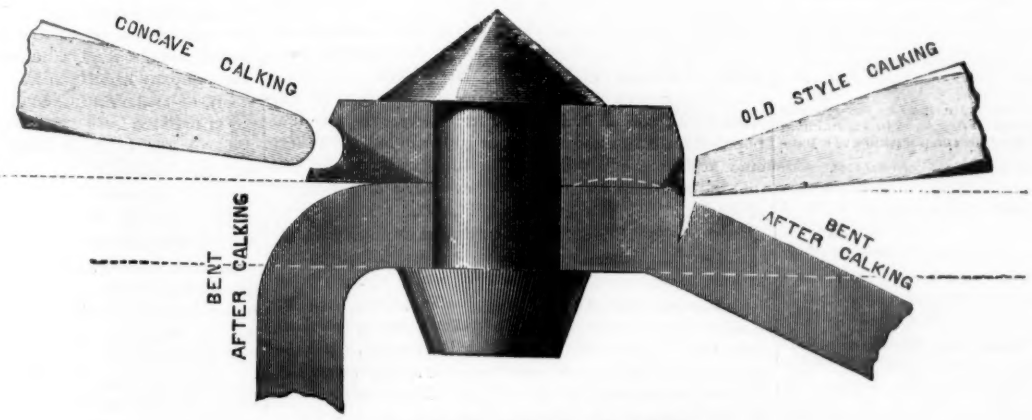
A correspondent writes: "Can you tell me which wheel of a truck slips in going round a curve, the inside or the outside one? If you would answer through your columns I think you would gratify a good many of your readers in this vicinity."

Can any of our readers answer this question?

Connery's Concave Calking.

The object in calking a boiler seam, it need hardly be said, is to make it steam and water-tight after the plates are riveted together. This is usually done with a tool resembling an ordinary cold chisel, but with a blunt point, instead of a sharp edge, as shown on the right side of the engraving, Fig. 3. This tool is driven against the lower edge of the boiler plate

Fig. 3.



CONNERY'S CONCAVE CALKING.

Fig. 4.

so as to compress the metal on the edge of the plate against that in contact with it. In the use of such a calking tool it frequently happens that, either through carelessness or want of skill, the sharp edge of the tool indents or cuts a groove in the plate under it, thus weakening the plate and rendering the boiler unsafe. The injury from this cause is also aggravated by the well known bending action which the strain on a boiler seam produces at the edges of a plate. This is illustrated in Fig. 2 and Fig. 3. A seam like that represented in Fig. 2 will, when subjected to a strain, have a tendency to assume the form of that shown in Fig. 3, which produces a bending action on the plates at *a* and *b*. If now a groove has been cut in the plate by a calking tool, there is already an incipient fracture, which is liable to extend by the bending action described.

The object of the device which we illustrate is to obviate the danger from the use of the ordinary calking-tool and substitute in its place one with a round point, like that shown on the left of Fig. 3. With such a tool there is of course no danger of cutting the plate, and at the same time it condenses the metal somewhat, as shown by the dark shading in the engraving, whereas with the old form of tool this effect could only be produced close to the edge, which often had the effect of forcing the plates apart inside of the edges, as shown by the dotted line on the right of the rivet.

We have a specimen of calking, from which the engraving was made, one side of which was done with the ordinary tool, and the other with the round-nosed tool. The plates were then bent into the position shown. The one, it will be seen, is bent at right angles without a flaw, whereas the other, when bent less than half as much, began to show a fracture along the edge.

Fig. 4 represents a gauge for making tools for plates of different thicknesses.

This method of calking is patented by Mr. James Connery, who has charge of the boiler shop at the Baldwin Locomotive Works, where it is exclusively employed. It is also used by other locomotive manufacturers and boiler-makers, and has been adopted by the United States Navy Department for its marine boilers.

Further information, including a descriptive circular, can be procured of the inventor by addressing him at the Baldwin Locomotive Works, Philadelphia.

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S. WRIGHT DUNNING AND M. N. FORNEY.

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Editorial Announcements.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE LONDON CITY RAILROADS.

The pending investigations, if such they may be called, of the New York Rapid Transit Commissioners, gives unusual interest to the completed examples of city railroads abroad and the results of their working. Almost the only examples are the London railroads, concerning the construction of which a great deal has been said at one time and another; but of whose practical results, aside from the carriage of enormous numbers of passengers at very low rates, and poor returns to the stockholders, little is known on this side of the Atlantic. These roads, like other British railroads, make half-yearly reports, and those for the first half of the current year have recently been published. A little study of these may not be uninteresting at this time, though we imagine that it will be well to say in advance that we need to be very cautious in drawing conclusions from these London roads to apply to our proposed New York road or roads.

It is common to speak of the London underground railroad as if it were a single line, or the property of a single company; but there are in truth four lines in London which deserve to be called city railroads, three of which are wholly below the surface, while a fourth, though much of it like the other three, extends to the suburbs, while the others are almost in the heart of the city.

The Metropolitan Railway (until recently the longest London underground line) carried 23,543,567 passengers during the first half of this year—the largest number yet, though for the whole year 1874 more than 44,000,000 were carried. The gross receipts from traffic were £222,988, which shows an average receipt of 2.273 pence per passenger, which is 4.6 cents gold, or (just now) a trifle more than 5 cents currency. The road is eight miles long, but there is a great deal of short traffic on it, and it serves largely for the distribution of passengers arriving by the other railroads, and there is no way of ascertaining the average journey of the passenger, or the average rate per mile. The working expenses were just 40 per cent. of the receipts, which shows the average cost of carrying a passenger to have been two cents. But the amount of capital invested in the undertaking is so great that even this exceptionally large traffic and exceptionally large proportion of profit enabled the company to pay only a dividend at the rate of 3¼ per cent. per annum. The road carries three classes of passengers, about three-fourths of them third-class.

Bearing in mind that the report is not for a year, but a half-year, we find that the receipts per mile of this road were at the rate of $162,609 in American currency—say $325,000 per year, or nearly five times as great as the Pennsylvania's main line receipts—truly an enormous income; and, as 60 per cent. of this is profit, the sum available to pay interest on the investment is $195,000 per mile, which is 7 per cent. on nearly $2,800,000. It is because the Metropolitan has cost nearly twice as much that it is an unremunerative undertaking. So far as receipts and profit are concerned, the result of this road ought to be encouraging, rather than otherwise, to the projectors of a New York city railroad. If it is said that the Metropolitan does not earn more than 4 per cent. on the capital invested in it, we may answer that a road may be built in New York for much less than half the cost of the London line.

Another London city road is the Metropolitan District, now eight miles long also, although last year it was but 6¾. The earnings for this line were, for the last half-year, at the rate of $93,500 per mile, American currency—at the rate of $187,000 per mile per year. It pays no dividends. The capital per mile at the end of 1874 was about $3,580,000.

A third, the Metropolitan & St. John's Wood, is but 1¾ miles long, and its earnings were $38,875 per mile for the half year—$77,750 per year. It pays no dividends.

The North London is longer than any of the others—12 miles—but is partly suburban as well as urban. It is the most profitable to its proprietors of all the London city railroads, owing mainly to its lower average cost; but its earnings too are enormous, reaching for the last half-year $82,300 currency per mile, or at the rate of $164,600 per year. Until 1873 this road paid 6 per cent. dividends quite regularly; in 1874 it paid 5 per cent. At the end of that year its capital account per mile was $1,730,000 American currency.

Here we have in London 29¾ miles of costly metropolitan railroad, which during the last half-year earned a total of $3,101,500 in American currency, or at the average rate of $104,250 per mile of line. Now there are those, doubtless, who will think this a case for a problem in simple proportion, and say: As London's three and a half millions are to New York's one million, so are the $6,000,000 yearly receipts of the London metropolitan railroads to the yearly receipts of New York's future metropolitan road, whence the latter=$6,000,000÷3½=$1,714,285.

Unfortunately such short and easy methods will not suffice. London is not New York, and a comparison of populations does not enable us to ascertain bulk of traffic, amount of earnings, profits, or anything of the kind. If it did, we would only know that a New York city railroad or system of city railroads, would probably have a gross income of about $1,700,000, and with the average percentage of working expenses of American railroads, it might have a net income of about $600,000, which will pay 7 per cent. interest on a capital of $8,500,000; and then we could conclude that a New York system costing no more than this amount would be a fair investment. But the circumstances are so different that it is hardly worth our while to look at these figures. The most important results of the working of the London roads for our consideration are the enormous bulk of their traffic, and the low cost of carrying it, proving that there are circumstances which make it possible to obtain a business to which that of our greatest trunk lines is trifling; that a railroad can accommodate such a traffic with safety without any extraordinary provision of tracks; and that with so large a traffic, the cost per unit, relatively to that on ordinary railroads, is greatly reduced.

We cannot say absolutely what the cost per unit of traffic is on any English railroad. We know, however, that the fare for the lowest class is rarely less than two cents a mile on the ordinary railroads, while on the leading Metropolitan line the average receipt on a line eight miles long is only five cents; and it is reasonable to suppose that the average journey on such a line is nearly one-half of its length. Then the average working expenses of British railroads have been recently about 50 per cent. of the receipts; the working expenses of the Metropolitan are 40 per cent. The average expense per passenger per mile on British railroads in general, therefore, must be as much as one cent gold, for the lowest class: on the Metropolitan, for all classes, it is but two cents currency *per trip*, and to make it as much per mile as on the other railroads would require that the average trip should be less than two miles—which is altogether improbable.

But there are circumstances which distinguish the London lines from any probable city railroad or system of city railroads likely to be built in New York. Some of these we will point out.

London is the center of a great system of railroads, which enter it from all directions, and have to connect with each other for the interchange of passengers and freight. There are twelve or fifteen distinct lines. New York is entered from but one direction—the north—and by but two lines, and so far as through passenger traffic is concerned, by but a single line. The larger part of the great system of roads built to carry traffic to New York have their termini in Jersey City; a few others, in Brooklyn, all separated by wide, navigable channels from the city, and never likely to run either their passenger or freight cars into the city of New York and to New York city stations, whatever metropolitan railroads may be constructed. Between the railroads and New York there is a great gulf fixed, which by the use of ferry-boats is not a formidable obstacle to traffic with the city, it is true, but is an almost insuperable obstacle to the interchange of traffic with the railroads which run their cars to stations within New York.

Now this is no trifling matter. If a New York elevated or underground railroad would enable the Pennsylvania, the Erie, the Central of New Jersey, the Delaware, Lackawanna & Western, the Midland, the Long Island, the Flushing, North Side & Central, etc., to run their passenger cars into the city of New York, to the Grand Central Depot, to a station down town, to one on the east side or one on the west side, or to any or all of these, and to run their freight cars upon the tracks of any other railroad and to freight stations at twenty places within the city of New York, it is evident that such a road would have an enormous traffic of this kind, altogether independent of the purely city passenger traffic for which it is now proposed to build one.

Now the London city railroads serve just this purpose of uniting the twelve or fifteen great railroad systems which have termini there, and affording routes by which passengers go from one railroad to another, as well as from one part of the city to another. To be sure, the roads named are not the sole connections, as several have been made by the great railroad companies themselves, and very little freight moves on the underground roads; but they are largely used for connections between different passenger stations, and this gives them a large traffic of a kind which will hardly have any place on a New York city railroad.

Another matter illustrated by the London roads is the cost of maintenance under so enormous a traffic. Here again we cannot depend upon London experience as an exact measure of what the cost in New York would be; but the figures will nevertheless be suggestive. On the Metropolitan for the last half of 1874, the total expense for maintenance of road, works and buildings was at the rate of just about $3,000 of our currency per mile of track (the company had 21¾ miles of track in its eight miles of road), or at the rate of $6,000 per year, which is $16,300 per mile of road. The Metropolitan District, with a much lighter traffic, paid out about $1,700 per mile of track for the same half-year; the North London (about one-third of whose income is from freight) expended $2,170 for maintenance for the same half-year. The rails of the Metropolitan, of steel, weigh 85 pounds per yard.

Another problem solved on the London lines is the running of trains with safety at very short intervals of time. It is evident from the number of passengers carried that there must be frequent trains, but it would seem natural that, for economy's sake as well as to secure longer intervals between trains, the trains should be made very large. This is not the case, however. The trains are small, on the average containing not more than five of the small English cars. This is not to permit an exceptionally high speed; on the contrary, it is a low speed—for England, extremely low—only about 15 miles per hour. Notwithstanding the light trains and low speeds, however, very heavy locomotives are employed—tank engines weighing, with coal and water, 100,000 lbs. This great power attached to a light load makes it possible to start and get under full headway very quickly, which is a prime necessity with a passenger road whose stations are close together—and on the Metropolitan there are two only 1,700 feet apart. Here some trains are allowed only two minutes for the stop at one station and the trip between the two! Generally but one minute is given for the stop at way stations, which again proves that a very rapid discharge and taking on of passengers is practicable.

By the time table of 1870, according to Schwabe, who visited the road that year, there were 798 trains daily to and from the Moorgate street station from ten minutes past five in the morning until four minutes before one at night—an average of one in a little less than three minutes! which we can hardly prevail upon ourselves to believe; though during business hours trains are generally not more than three minutes and in some cases only two minutes apart. Well may the German investigator whom we have quoted say: "This running is unique of its kind, and it is necessary to have seen it to admit its possibility." However, about two miles of the road, over which ran 31 trains which went no further, have four tracks.

Altogether, the experience of the London city railroads shows that a structure in New York may be made to accommodate the largest traffic we can expect one to get, with two parallel tracks devoted solely to passengers; that with an exceptionally large traffic and a solid structure the cost of carriage may be very small; and that with a fraction of the net income per mile of the London city railroads, good interest could be paid on the estimated cost of the most expensive elevated railroad yet proposed. The difference in the cost of working such a road in New

York, as compared with London, can be ascertained approximately, but the bulk of the traffic cannot—at least the experience of London gives very little help in making an estimate of such traffic. But with economical structures like most of those proposed, but trifling net earnings, compared with those of the London roads, would be required to make them abundantly profitable; and if they are such as will really afford comfort and convenience to the population moving up and down town, it is hard to believe that they will not secure traffic enough for this purpose. At least, in view of the shocking results of the late census, showing an increase of less than 5 per cent. in the population of Manhattan Island during the past five years, the landowners of New York city cannot afford to permit it to be without such a road much longer. They can well afford to build the costliest structure yet proposed and work it entirely without profit rather than suffer the losses, or lose the otherwise certain gains, which will be the result of the continuance of the present condition of things.

A Summer Excursion.

The "fatigue of metals" is now so commonly recognized that the phrase has become a sort of technical term to describe the condition of iron and other materials when they have become tired, so to speak, from being subjected to frequent strains. That their strength is restored by repose is also a well-established fact, and nearly all master mechanics have observed that locomotives which are allowed to rest periodically will do more work with a given amount of repairs than they will if kept in service continuously. It seems rather remarkable that with all the wonderful safeguards which nature has provided to prevent us from overstraining the delicate machinery of our bodies and minds, the fact that a locomotive grows weary should impress upon us the importance of seeking rest and "to lie up for repairs." Nevertheless, we believe that most people when they hear the fact stated for the first time at once feel a strong desire, to use shop phraseology, to "knock off and loaf." The writer attributes his own inclination in this direction partly to the fact that during the past winter he had listened to Professor Thurston and had been studying with more or less care the phenomena of the "fatigue of metals," and felt generally during the month of July as though he had worked quite up to the "elastic limit." The result was that a fine summer morning found him, not long since, with the matured purpose of leaving New York, and of visiting Saratoga, and of sauntering about, as leisurely as express trains and steamboats would permit, along rivers, over lakes and among the mountains, while, as opportunity occurred, he purposed visiting railroad men in their smoky haunts where they have spun webs more intricate than spiders, but composed of iron rails instead of gossamer threads. With this intention, then, he reached the Grand Union Depot in New York in ample time for the "Saratoga express." This train is made up chiefly of Wagner drawing-room cars, with one or more ordinary cars, which, report said, were usually overcrowded and often occupied by some very disagreeable people. The writer consequently determined to take a chair in what a friend calls the "swell cars," and applied for a secured seat at the proper office. The attendant was a young man who seemed to make it his aim to appear "as smart as a steel trap." He closed all his remarks with a sort of snap, and unless great self-control was exercised by the applicant for a ticket, he was made to feel as we imagine a rat does when he has been trying to steal the bait without springing the trap. When he—the young man, not the rat—began a remark, he started easy, but shut up with a bang like the valve of a hydraulic ram. Now, for all we know, he may be a very well-meaning person and faithful to his employers, but it is safe to advise him to lay to heart the efficiency of molasses in comparison to vinegar in the capture of flies. Here we might as well give a little advice to railroad subordinates, which has been on hand a long time, and which may be worth to them as much as—many years' subscription to the *Railroad Gazette* would amount to. This advice is: *be polite, young man.* You never can tell what the effect of your intercourse with strangers may have on your career. If, for example, the writer were acquainted with Mr. Vanderbilt, which he is not, or with Mr. Wagner, who manages the drawing-room cars, which also he is not, and should chance to suggest to either of them that he had better put a muzzle on a certain ticket agent, the effect might be that for some reason the agent aforesaid might find that the ground on which he stood officially would suddenly give way, and instead of being asked to go up higher, the invitation might be to "step down" or "out." Now, doubtless, a great many men who do know either Mr. Vanderbilt or Mr. Wagner apply, as we did, at that same little window for tickets to the drawing-room car. Now, if the person behind it is not very careful, our imaginary conversation may become a real one and—we leave him to imagine the result. If, however, persons in similar positions would only lay to heart, what is a fact which they can observe for themselves, that everybody likes cheerful people, and is inclined to befriend them, they would certainly oftener get the good will of people, and only those who have had an opportunity for observing know how valuable a word uttered at the right time may be to an employe on a railroad in securing for him the promotion which all seek and desire. There was a young man loading wood in a steamboat yesterday, who did it so merrily, and who, at every landing, moved about so cheerfully, that every passenger who looked on felt a friendly impulse towards him, and those who see him daily would doubtless soon act, as well as feel, the part of a friend to him. Of course, politeness and cheerfulness are not the only traits which should be cultivated to secure advancement. No matter how polite an unfaithful, indolent, dishonest or inaccurate person may be, no amount of suavity will atone for these defects of character; but many an otherwise capable person is never advanced because he habitually assumes a sort of porcupine, bristly offensiveness in his manner, and thus fails to make friends, and is therefore without any at the critical time when friends could be of the most service.

This journey gave us the first experience in riding through the whole length of what is called the Fourth Avenue Improvement, or the depressed and underground track in that street. A single journey through it is sufficient to show that the arrangements for providing ventilation are entirely insufficient to keep the air in even a tolerable degree of purity. The whole atmosphere in nearly the whole length of the covered portion is filled with coal gas, the effect of which is very disagreeable. Besides, the frequent alternations from broad daylight to sometimes absolute darkness are anything but agreeable. It is, we believe, safe to predict that with anything like the number of trains which would be demanded by a road worked as a line for "rapid transit," at all adequate to the demands of New York city, the air in the underground portion of the line would be simply intolerable, and dangerous to life and health. The results of working this line ought, we think, to set at rest forever any idea of an underground road for rapid transit in New York.

A ride on the Greenwich-street Elevated road, on the contrary, is in the open air, with a fine view of the street below, and plenty of light to read, the latter advantage being a very great one to those whose only opportunity during the day for reading the morning or evening paper is that afforded by their journey to and from their places of business. An elevated road constructed on Third avenue, or on any street parallel near to Fourth avenue, would make it impossible to secure any considerable local traffic on the latter line, excepting such as might be compelled to travel there.

Among the delusions now entertained and to some extent cherished by railroad managers, and destined to pass away, we believe, may be numbered that of palace or parlor cars, as they are called. That there should be some liberty of selection in the company we will travel with, we believe to be right, and founded on a proper distinction which all right-minded people make in all other social relations. That is, a person who is cleanly in his language and habiliments ought to be given the privilege of excluding from immediate personal propinquity those who are offensively filthy in habits or raiment. Our institutions and traditions do not, it is true, recognize classes which are distinguished by birth or social position, but our standards of morals do classify people by their conduct and characters. Now the fault which we have to find with the present parlor cars is that they make wealth and display the basis of classification, that, owing to the large amount of money expended for show the charges are necessarily too high for persons of moderate means, and that the cars are less comfortable than ordinary cars would be if more skill and knowledge were exercised in their construction. In order to make a display of large plate-glass windows, the latter are made more than twice as wide as is usual. The result is that each window must serve for two seats, so that neither person has so good a view as he would have with the ordinary window. In the next place, arm-chairs are provided because they look luxurious. These chairs of course seat only one person, so that a car can carry only half as many passengers as those of the ordinary construction. The result is that the charges must be much greater than they need be if more persons could be seated. The great weight and the costly upholstery and wood work also add to the expense of maintaining such cars. If, however, instead of such cars, those of the ordinary plan were built, without any effort at useless display and ornamentation, the sole aim being to make them comfortable and keep them clean, and if the seats were arranged in the usual way, but of ample width, not less than 36 inches from the center of one to the center of the other, with the most comfortable and least showy upholstery, but kept scrupulously clean and well warmed and ventilated in winter, the cost of providing reserved seats in such cars would be about one-half that of seats in our present "parlor" cars. Passengers could also have the privilege of taking the entire seat, or space sufficient for two passengers, if they wished, and would thus be secure from intrusion. Such cars could be made even lighter than those now in common use, if only the designers could divest themselves of the pernicious and expensive propensity for absurd ornamentation.

It is amusing, too, to observe what awkward descents human vanity makes when it comes in contact with stern facts. If any adequate reason could be assigned for the use of the large plate-glass windows, it would be that they give the occupants of the cars on the Hudson River Railroad a better view of the matchless scenery along that line. It was found, however, that to open these windows in summer was to admit a tornado of wind and a simoon of dust when the train is running at full speed. It was, therefore, found necessary to insert in each window a wire screen as long as the full width of the window and about 10 inches wide. The sash is raised up, and the screen is placed between it and the window sill. This, of course, raises the sash rail that distance above the sill, and brings it directly on the line of sight of passengers in looking out of the window. It is, therefore, necessary in order to see out either to stretch one's neck so as to see over the rail or else crouch down in an equally uncomfortable position in order to see under it. The privilege of doing this costs $1.50 from New York to Saratoga.

At present we are not able to command the use of a sufficient number of adjectives to describe the Hudson River and its scenery adequately. As several thousands of persons have tried to do the same thing before, the omission may be excused, and probably with some gratitude.

Saratoga presented the usual kaleidoscope, by describing which numberless newspaper correspondents have earned bread and butter, if not much repute, during the present and past summer. The lion and the lamb, and likewise the bull and the bear, to say nothing of the tiger, who has his lair there, lie down together. Jews, gentiles and—being race week—jehus eat, drink and lounge together, and extemporize cavernous yawns at the length of the days and the dreariness of what they choose to regard as their summer recreation.

From Saratoga our journey was laid out through Lake George and Lake Champlain to Burlington, Vermont, and thence to St. Albans. To reach Lake George from Saratoga, travelers go to Glenn's Falls, and thence by stage to the Fort William Henry House, at the head of the lake. The ride by stage, a distance of nine miles, is very romantic, and through nearly the whole distance is over historical ground, and the scenes of many fierce contests during the old French war, and, later still, during our own revolutionary war. Unfortunately, most of this particular ride was after dark, so that it was more by faith than by sight that the fields of bloody battles were looked upon.

The Fort William Henry House, as many of our readers know, is a large hotel opened as a summer resort, and situated among some of the most romantic scene y in the country. A small steamboat runs up and down the lake and carries excursionists almost exclusively. The sail is one of the most delightful imaginable, and it would be easy to fall into a vein of fine writing in describing it. We will, however, only venture into description to the extent of explaining what many persons either have never known, or else have forgotten, which is, that the mouth of the lake is at the northern end, from which a stream leads into Lake Champlain. The land crossed by stage from Glenn's Falls to Lake George is the divide between the Hudson River and the lakes which empty into the St. Lawrence River. Lake George is 240 feet higher than Lake Champlain, and consequently the stream connecting the two furnishes excellent water power about Ticonderoga. Formerly the distance, five miles, from Baldwin, the northern end of Lake George, to Ticonderoga, on Lake Champlain, was traveled in stages, but since last season the Delaware & Hudson Canal Company has completed a branch road between these two points. It is of course a descending grade from Lake George to Champlain, for a part of the distance over 100 feet per mile. The cars on this branch were built expressly for Summer travel and have openings in the sides as large as the windows in drawing-room cars. These openings are covered with curtains in stormy weather, but are not glazed. The seats are arranged longitudinally in the centre of the cars, and the passengers sit back to back. The cars are admirably suited for the purpose for which they are intended, and for so short a journey as that over the branch road on which they are used.

A line of excellent steamers plies on Lake Champlain and lands at Burlington, Vermont, Plattsburg and Rouse's Point, New York. The landing at Ticonderoga is very near the ruins of the old Fort. Further north on the lake, the steamer passes the ruins of Fort Frederick on Crown Point, which, although not so often heard of, is now in a better state of preservation than Fort Ticonderoga.

At Burlington the Central Vermont Railroad took us to St. Albans, where we spent part of a day with Mr. Foss in looking through the shops of that road. These shops are large and very permanently built of brick. There are two engine houses, one with 28 and the other 23 stalls, each of them occupying somewhat more than the half of a complete circle. The tools in the shops are chiefly from the Putnam Machine Company's works at Fitchburg, Mass., but we noticed several steam hammers built by Ferris & Miles, of Philadelphia. Many of engines are a little antiquated in design, but the late ones built by Mr. Foss are good examples of serviceable American locomotives. The fuel is chiefly wood, in burning which Mr. Foss dispenses with a grate, and uses instead a system of what might be called deflecting plates, which were used in what was called the old Buffalo grate, but which it would be impossible to describe intelligibly without an engraving. Mr. Foss has abandoned the arrangement originally employed for admitting air through the bottom of the ash-pan, and has provided, instead, openings and dampers at the front and back ends. We noticed a very complete model of link-motion nearly finished in the shop, which Mr. Foss remarked he was having built because he knew of no easier and more effective way of saving fuel than by trying his valve gear with such a model. Many other master mechanics might, we feel sure, profit by following his example.

The Central Vermont road, as most of our readers know, is now, and has been, in a state of perturbation for some time past. This fact, with a diminished business, has been the cause of very great dimunition of work done at the shops, and general dullness is the prevailing characteristic. All new work has been stopped, and only such as is absolutely necessary is done. The result is that there is very little new to report, and the effort there, as well as in many other shops, is directed more towards economy than to new improvements. We noticed, however, a draw-head, which we can commend very highly. It consisted simply of a cast-iron draw-head with a strong lug cast on top, so as to act as a stop and prevent the head from being pushed in further than the lug. In this position there is ample room between the coupling-pin and the end timber of the car to enable a person to grasp the pin without danger of having his hand crushed when one of the cars butts against the other. We hope to publish an engraving of this as soon as some contemplated improvements are added to it. Mr. Foss also showed a model of his improvement in the "inside" pipes for locomotives; but as we will soon publish an engraving of this, we will not describe it further than to say that it consists of a pipe made in the usual telescopic form, but so that both the top and bottom sections are adjustable by separate levers within reach of the locomotive runner. A gigantic snow plow, which the severity of the winter makes necessary on this road, interested us very much, as it was the largest specimen we have ever seen. As a description without drawings would be very uninteresting, and probably unintelligible, we will only

remark that it would be worth examination by any one intending to construct such a machine.

The Central Vermont depot, which is just opposite the shops, is a substantial brick structure of a somewhat barn-like character, and with accommodations for passengers which are hardly up to the modern demands. The general offices of the company are in a wing built to the depot building.

The rolling mill of the St. Albans Iron and Steel Works is only a few rods below the railroad shops. The works are now employing about 200 men, which is about two-thirds of their full force. The mill is chiefly employed in re-rolling old iron rails, and the aim of its manager is to produce the best quality of iron rails. The form of rail chiefly rolled is very nearly that of the Sandberg sections, although, of course, whatever patterns are demanded will be rolled. They have recently filled an order for 40-lb. rails for the narrow-gauge road built from Boston to Lynn. We received some very interesting information regarding the method of keeping the accounts of the operation and production of the mill from Mr. Gustin, the Superintendent, which we may refer to in future, as an example for railroad men to imitate in their shop accounts.

Foreign Railroad Notes.

On the Continent of Europe, in 1874, the mileage of new railroad opened in each country was:

	Miles.		Miles.
Germany	960	Italy	304
Austria-Hungary	365	Spain	20
France	460	Denmark	85
Belgium	29	Sweden	599
Netherlands	41	Russia	1,161
Luxemburg	20	Roumania	168
Switzerland	103	Turkey	140
Total new mileage on the Continent			4,455

The increase in England for the same year was very little—probably not more than sixty miles. Making such an allowance for England, the total mileage of Europe at the end of 1874 was 84,150 miles, with about 38,600 locomotives, 83,500 passenger cars, and 938,000 freight cars.

Dr. G. Stuermer, of Bromberg, has collected statistics of the railroad rolling stock throughout the world. He finds that in the whole of Europe at the close of 1873 there were 79,730 miles of railroad (the United States at that time had about 70,000 miles), from all but 5,500 miles of which he had returns of rolling stock. The 74,230 miles reporting had 34,093 locomotives, 73,576 passenger cars, and 827,052 freight cars. This is at the rate of 0.467 locomotive, 0.998 passenger car, and 11.109 freight cars per mile of road.

The locomotive performance was reported for about 52,000 miles of the road, for 1873 or 1872, and the average mileage made by each was 15,130, or 41 miles per day, and an average of 21 trains daily over the whole mileage of railroad. The average number of trains per day in different countries in 1873 was:

Great Britain	33.0	Austria	10.9
Belgium	29.3	Switzerland	10.9
France	22.1	Denmark	8.5
Germany	19.8	Spain	7.3
Netherlands	14.9	Norway	7.2
Italy	13.2	Roumania	6.3
Russia	12.8	Portugal	5.7

Dr. Stuermer estimates the length of all the railroads of the world at the close of 1874 at 172,930 miles, with 56,700 locomotives (having in the aggregate 1,134,000 horse power), 103,700 passenger cars and 1,356,600 freight cars.

The British "Railway and Canal Traffic Act" of 1854 enacts that every "railway or canal company having or working railways or canals which form part of a continuous line of railway or canal, or railway or canal communication, or which have the station, terminus or wharf of the one near the terminus, station or wharf of the other, shall afford all due and reasonable facilities for receiving and forwarding all the traffic arriving by one of such railways or canals by the other without any unreasonable delay," and without any undue or unreasonable preference or advantage. The Act of 1873 supplementary to this declares that such facilities shall be taken to include the due and reasonable receiving, forwarding and delivery by every company at the request of another company of through traffic at through rates. The company requiring the traffic to be forwarded must give each forwarding company written notice of the amount and apportionment of the through rate and the route by which the traffic is proposed to be forwarded, and every company upon which such notice is served must, within ten days, either agree to the proposed rate and route, or state grounds of objection for consideration by the Railway Commissioners.

The law of Great Britain by which the mixed court called a Railway Commission was established requires that every company shall keep at each of its stations a book showing all its freight rates from that station to all other stations to which it ships, *including any rates charged under any special contract;* and the Commissioners may, on application of any interested party, require the company to distinguish in such book how much of such rate is for the conveyance of the freight, and how much for other expenses, specifying the nature and details of such other expenses. In one case a dealer, who presumably delivered his freight ready loaded on cars, or competed in business with others who did so, received an order from the Commission requiring a railroad company to state what part of its charge was for terminal expenses; and another decision declares that any one has the right to copy the rates in the rate books kept at the stations.

It is reported that an English train "guard" has been discharged for refusing to attach and guard 73 cars of coal in one train, the load alone weighing 756 tons, believing that he could not keep so heavy a train under control. These trains have brakes only on the "brake van" at the rear, in which the guard rides.

During the first quarter of 1875 the number of accidents on Austrian railroads was 502, of which 446 were train accidents. By all these accidents 47 persons were killed and 77 injured. By fault of the railroads four passengers were injured; by their own fault or by unavoidable accident 3 passengers, 54 employes and 20 other persons were injured, and 3 passengers, 21 employes and 28 other persons killed. In 271 cases there was destruction or damage of rolling stock, in 26 destruction or injury of road and apparatus, and in 355 delays of trains. There were 218 employes in fault, 217 of whom were punished by the railroad managements and one through the courts.

The German Commission of Inquiry on Railroads, of nine members, recently appointed by the Chancellor of the Empire, has completed the first part of its work by the examination of 42 experts in the departments of agriculture, manufactures, commerce and railroad business. The railroad men examined were twelve in number, and, besides those whose occupations cannot be gathered from their titles, included three directors, one "Chief Inspector," one "Chief Freight Inspector," one "Station Inspector" and one "Chief Comptroller." Dr. Emden, of Hamburg, Secretary of the Chamber of Commerce, is to prepare the report.

A project for a new postal law for the German Empire, mentioned a few months ago in these columns, required the railroads to do pretty much all the work required by the Post-office Department almost without pay. This project being submitted to the Justice Commission of the Council of the Confederation was set aside by it, and a new project has been drawn up which is to be considered at the next session of the Reichstag, or German Parliament. It is reported that the new law will make it a condition of new railroad charters that the roads do the postal service almost without pay. This, as a tax, understood and provided for beforehand, and uniform in its application, might be entirely just; but the affair is complicated by the large package business performed by the Post-office Department, in which it competes directly with the railroads. The Post-office Department in Germany as it is does a much more profitable business than the railroads. The latter say that if they are compelled to do the mail carriage for nothing the Department will be able to reduce the rates on packages to the bare cost of handling, and thus make it impossible for the railroads to do any such business without loss.

The German Field Railroad Battalion, organized since the French war, works entirely a railroad nearly 30 miles long, leading from Berlin to the artillery practice grounds, and is frequently sent to repair other railroads and bridges after accidents, and to assist in the construction of new railroads. In time of peace the battalion consists of four companies, which form the basis of twelve companies, to be recruited from practical railroad men in time of war.

Record of New Railroad Construction.

This number of the *Railroad Gazette* has information of the laying of track on new railroads as follows:

Boston, Revere Beach & Lynn.—This road, of 3-feet gauge, is completed from East Boston northeastward 10 miles to Lynn, Mass.

Bath & Hammondsport.—This line, also of 3-feet gauge, is completed from Bath, N. Y., on the Erie Railway, northeastward 10 miles to Hammondsport.

This is a total of 20 miles of new railroad, making 538 miles completed in the United States in 1875, against 839 miles reported for the same period in 1874, 1,872 in 1873, and 3,237 in 1872.

British Wheat Imports, as reported by the Board of Trade, for the first half of 1875 were not 1 per cent. less than for the first half of 1874, and the proportion received from this country was nearly as great this year as last. The amounts and the proportions of different countries for the first half of each of the three last years, have been:

First half of	1875.	1874.	1873.
Total British imports, bush.	35,435,460	35,631,540	34,809,928
Percentage from—			
United States	58.4	60.5	39.0
Prussia	20.0	12.8	28.7
Germany	10.7	8.1	6.5
France	1.4	2.0	6.2
British North America	3.1	3.6	3.0
Chili	1.6	4.4	3.3
Turkey, etc	1.8	2.1	1.3
Egypt	1.0	0.5	3.4
Denmark	0.4	0.4	1.3
Other countries	7.3	7.7	1.3

The prevailing impression that our exports have fallen off greatly is due chiefly to the assumption on the part of those who deal with Atlantic ports that the exports of these ports are equivalent to United States exports, and neglecting entirely the Pacific exports, which were more than a third of the whole this year, and increased while the receipts at Atlantic ports fell off 37 per cent.

The flour imports, and the proportions from the chief sources of supply, were for the first half of the same three years:

	1875.	1874.	1873.
Total British imports, bbls.	1,611,828	2,010,602	1,939,425
Percentage from—			
United States	39	54	10¾
France	37	6	43
Germany	8	13	12

France makes its chief exports in the form of flour, and, when it has a good harvest, is our chief competitor in the British market.

Counterfeiting Tickets.

A young lawyer named Adam V. Forbes, residing in Clyde, N. Y., has been arrested for counterfeiting New York Central Railroad tickets, and confessed that he had used a large number. His method was to print tickets from Clyde to Chili or Charlotte, places beyond Rochester, and use them to ride to Rochester, the conductor, of course, only punching them and not taking them up. These tickets Forbes would afterwards destroy. The only thing which led to his detection was a chance remark made by a conductor as to the number of tickets from Clyde to Chili and Charlotte which he had recently punched. This gave rise to suspicion, very few such tickets having been returned, and a detective was set to work.

General Railroad News.

PERSONAL.

—Mr. Benjamin Bannan, for many years and until recently editor and proprietor of the Pottsville *Miner's Journal*, and a leading authority on coal statistics, and, indeed, on everything connected with the anthracite coal production, died at his residence in Pottsville, Pa., recently, at the age of 68 years. He was a prominent and highly respected citizen.

—Mr. William H. Jamar, for ten years past Paymaster of the Philadelphia, Wilmington & Baltimore Railroad, died at his residence in Wilmington, Del., July 27, after a severe illness, caused by an abscess on the liver.

—Mr. Edward F. Folger, at one time General Ticket Agent of the New York Central, later President of the Maryland Steamship Company, and since 1872 Superintendent of the Richmond, York River & Chesapeake road, died in Baltimore June 3, at the age of 51 years.

—Mr. F. R. De Vou, late Secretary of the Wilmington & Western Railroad Company, has been charged, in connection with the ticket agent at Wilmington, with embezzling a considerable sum of money by means of tickets which were sold by the agent, and not returned by the secretary when sent to him canceled by the conductors.

—Hon. Charles A. Gilman has been nominated for the office of Railroad Commissioner, by the Republican Convention in Minnesota, in which State that officer is hereafter to be elected by the people.

—Mr. George O. Crocker has resigned his position as Division Engineer of the Illinois Division, Baltimore, Pittsburgh & Chicago Railway, and accepted an appointment as United States Assistant Civil Engineer in charge of the survey of a canal route from Lake Michigan to the Wabash River, for which appropriation was made by the last Congress.

—On the occasion of the death of Mr. H. A. Gardner, Chief Engineer of the Michigan Central Railroad, Mr. William B. Strong, the General Superintendent, issued the following, dated July 29:

"Mr. H. A. Gardner, late Chief Engineer of the Michigan Central Railroad Company, died at Chicago the morning of Monday, July 26, 1875. The death of one so eminent in his profession, connected with the company in so important and responsible an office, should not pass without fitting notice; and while regretting his loss, it is a pleasure to testify to his high character and worth. The ability shown in his performance of the duties of the last of the many responsible positions held by him insured the respect of his fellow officers, and his genial disposition won the warm personal regard of all brought into business or social relations with him. In his death the company loses an esteemed officer, and his associates a valued colleague and friend."

THE SCRAP HEAP.

Locomotives and Lightning.

A subscriber asks if a locomotive in motion has ever been struck by lightning, and if not, why not. We have never heard of lightning's striking a locomotive either in motion or at rest, but know of no reason why it should not. But it forms so perfect a conductor with the track on which it stands that probably it might be struck without attracting attention. It is only when lightning finds its path obstructed that it makes a tumult.

Some Questions.

The Jersey City *Journal* says: "During the lapse of ten minutes by the clock, the following questions were put to Andrew Kew, the chief gateman at the Pennsylvania depot, each question being asked by a different person: 'How long will I have to lay over in Brunswick on my way to Pennington?' 'When will the ticket office be open?' 'When is the first train for New Brunswick?' 'What time will I get to Railway?' 'Isn't there a train before two o'clock?' 'I want to go to Newark with this boy; can I go on the Freehold train?' 'What time does the next train leave for Newark?' Am I in time for the Amboy train?' 'When will there be a train for Newark?' 'Please give me a chew of your tobacco?' When is the next train for Elizabeth?' 'Have you got a pin about you?' 'When is the next train for Newark?' 'Train for Newark ready?' 'Where can I get this bag checked?' 'Where will I buy a ticket for Newark?' 'This train for Philadelphia?' 'Is this the way to Englishtown?' 'Germantown?' 'Where's the train for Old Bridge?' 'Is that 'ere clock right?' 'When can I go to Monmouth Junction?' 'Lawrence?' 'Jamesburg?' 'Does this railroad go to Campgaw?' 'Ish dot drain gone py Nuark?' 'Trenton?' 'Whin kin I go till Wesht Philadelphy?'

"At this point the reporter left. Andy had answered every question courteously."

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods have been reported by the following companies:

Year ending June 30:	1874–75.	1873–74.	Inc. or Dec.	P. c.
Atlanta & West Point	$292,718	$324,093	Dec.. $31,375	9.7
Expenses	185,748	212,079	Dec.. 26,331	12.4
Net earnings	$106,970	$112,014	Dec.. $5,044	4.5
Earnings per mile	3,365	3,725	Dec.. 360	9.7
Per cent. of expenses	63.46	65.44	Dec.. 1.98	3.0
Six months ending June 30:	1875.	1874.		
Gilman, Clinton & Springfield	$119,657	$117,428	Inc .. $2,229	1.9
Expenses	95,412	.....	.....	....
Net earnings	$24,245	.....	.....	....
Earnings per mile	1,078	$1,058	Inc .. $20	1.9
Per cent. of expenses	79.74	.....	.....	....
Five months ending May 31:	1875.			
Shenango & Allegheny	$68,877	.....	.....	....
Expenses	42,944	.....	.....	....
Net earnings	$25,933	.....	.....	....
Earnings per mile	2,087	.....	.....	....
Per cent. of expenses	62.35	.....	.....	....
Three months ending March 30:	1875.			
Atlantic & Great Western	$864,145	.....	.....	....
Expenses	676,478	.....	.....	....
Net earnings	$187,667	.....	.....	....
Per cent. of expenses	78.28	.....	.....	....
Month of July:	1875.	1874.		
Union Pacific	$1,034,653	$850,143	Inc . $184,510	21.7
Week ending July 16:				
Great Western	£14,369	£17,800	Dec. £3,431	19.3
Week ending July 17:				
Grand Trunk	£38,000	£38,400	Dec. £400	1.0

Erie Canal Traffic.

Business at Buffalo from the opening up to August 1, is reported as follows:

	1875.	1874.	Decrease.	P.c.
Receipts of tolls	$296,827	$593,890	$297,063	50.3
Boats cleared	2,340	3,652	1,312	35.9

The canal opened May 18 in 1875, and May 5 in 1874.

Flour and Grain Movement.

Receipts and shipments for the week ending July 24, are reported as follows:

Flour:	1875.	1874.	Inc. or Dec.	P. c.
Lake ports' receipts	100,502	87,101	Inc.. 13,401	15.4
" " shipments	100,213	99,441	Inc.. 772	0.8
Atlantic ports' receipts	173,167	173,615	Dec . 448	0.3
Wheat:				
Lake ports' receipts	2,163,508	1,186,376	Inc.. 977,132	82.3
" " shipments	2,042,025	689,995	Inc.. 1,352,030	196.0
Atlantic ports' receipts	1,240,854	1,004,510	Inc.. 236,344	23.5
Grain of all Kinds:				
Lake ports' receipts	3,964,658	3,020,789	Inc.. 943,899	31.3
" " shipments	4,119,353	2,101,661	Inc.. 2,017,692	95.0
Atlantic ports' receipts	2,457,446	2,836,070	Dec.. 378,624	13.3

The immense increase in the movement at lake ports is the striking feature in this report. The number of bushels shipped in this one week exceeds an eleventh of the shipments of the calendar year—29 weeks—that is, was about two and a half times the average.

Of the total grain shipments from lake ports, 18⅓ per cent. went by rail, against 16½ per cent. for the corresponding week in 1874, and 13 per cent. in 1873.

The shipments of wheat from Oregon for the year ending with June, amounted to 2,396,667 bushels, and the flour to 227,796 barrels. Reducing flour to wheat, we have the total equivalent to 3,535,600 bushels. Subtracting the small amount sent to California, we have left a balance of 3,129,000 bushels exported, which, added to the California exports for the same time, makes a total of 20,090,000 bushels exported from our Pacific coast during the year.

Buffalo grain receipts for the seven months ending July 31 were reported as follows, by the *Commercial Advertiser*:

	1875.		1874.	
	Flour, bbls.	Grain, bu.	Flour, bbls.	Grain, bu.
By lake	418,239	20,686,257	614,765	26,405,589
By rail	767,100	10,985,130	1,129,352	17,033,321
Totals	1,185,339	31,671,387	1,744,117	43,438,910

The decrease in flour this year was 32 per cent. and in grain 27.1 per cent. Of the flour 64.7 per cent., and of the grain 34.7 per cent. came by rail. The shipments of grain for the same period were.

	1875.	1874.
By canal, bushels	12,800,106	19,835,554
By rail, bushels	5,790,474	6,321,678
Totals	18,590,580	26,157,232

A decrease of 7,566,652 bushels, or 28.9 per cent. The rail shipments were 31.1 per cent. of the whole in 1875, and 24.2 per cent. in 1874.

Chicago receipts for the week ending July 31 were 41,731 barrels of flour and 2,326,190 bushels of grain of all kinds in 1875, against 22,643 barrels of flour and 1,784,881 bushels of grain in 1874. The shipments were 38,425 barrels of flour and 1,671,672 bushels of grain this year against 27,921 barrels of flour and 1,255,004 bushels of grain last year. The increase in grain is 30 per cent. in the receipts and 33 per cent. in the shipments.

Coal Movement.

The following coal tonnages are reported for the week ending July 24:

	1875.	1874.	Inc. or Dec.	P. c.
Anthracite	587,324	347,442	Inc..239,882	69.0
Semi-bituminous, Broad Top and Clearfield	21,624	.....	.....	....
Cumberland	49,665	.....	.....	....
Bituminous, Barclay	7,124	.....	.....	....
" Western Pa	38,922	.....	.....	....
" West Va	2,488	.....	.....	....
Coke, Western Pa	13,573	.....	.....	....

The coal tonnage of the Pennsylvania Railroad for the third week in July was as follows:

	Tons.
Anthracite	27,387
Bituminous	62,497
Coke	13,579
Total	103,463

The St. Louis *Railway Register* reports coal receipts at that city for the three months ending June 30 as follows:

	Tons.
Belleville & Southern Illinois	58,200
Vandalia Line	36,870
St. Louis & Southeastern	34,138
Illinois & St. Louis	32,990
Ohio & Mississippi	24,642
Atlantic & Pacific	2,351
St. Louis, Iron Mountain & Southern, Arkansas Div	100
" " " Belmont Div	45
Total	189,336

Reports are lacking from the Cairo & St. Louis and the Chicago & Alton. It will be seen that the great bulk of the coal came from Southern Illinois.

OLD AND NEW ROADS.

Boston, Revere Beach & Lynn.

This road has been completed and was opened for public traffic July 29. Some work yet remains to be done on the stations along the line, and on the ferry-house in Boston. The road, which is of 3-feet gauge, and intended entirely for suburban travel, runs from East Boston through the town of Revere to Lynn, following along the beach a great part of the distance. It is about 10 miles long. A considerable revenue is also expected from pleasure and excursion travel in the Summer. The company owns a ferry of its own between East Boston and Boston, by which connection with the road is had.

The company has offered free passage over the road for a year to any one buying land and building a house along the line of the road. The object, of course, is to encourage suburban settlements along the line.

The business of the road has opened so well, and the number of passengers traveling over it is so large, that the directors have already voted to put down a second track. All the bridges were made for a double track in the first place. Three new engines and 10 cars will also be ordered at once. Work on the station buildings is being pushed forward.

Tennessee Railroad Taxation.

The East Tennessee, Virginia & Georgia Company has given notice of its intention to pay the 1¼ per cent. on gross earnings, which the law allows to be paid in lieu of all other taxes.

The State Assessors have issued a circular to all the companies, requesting them to give notice of their intention under the law. If no answer is received, an assessment of the property will be made. Several companies claim exemption under their charters.

Boston, Hartford & Erie.

The final transfer of the property to the New York & New England Company has been made, and the trustees have ceased to operate the road, which is now worked by the new company.

Utica, Ithaca & Elmira.

At the first meeting of the new board, held in Ithaca, July 31, after electing the officers and committees for the ensuing year, the President was authorized to execute a contract with the Elmira Iron Company for steel rail and fish-plates for the entire road, according to a memorandum agreement presented. A contract to allow the Utica, Ithaca & Elmira Railroad to cross the track of the Delaware, Lackawanna & Western Railroad, on grade, near the old Pugsley depot, was also confirmed.

Indiana Railroad Taxation.

The assessment of the railroad property in the State of Indiana has been finally completed by the State Board of Equalization. The total valuations are as follows:

Main track, 3,881.45 miles	$27,809,559
Sidings, 499.58 miles	1,997,494
Equipment	8,574,395
Total	$38,381,448

The valuation of main track varies from $16,500 per mile, at which the Lake Shore, the Michigan Central and the Pittsburgh, Fort Wayne & Chicago are assessed, down to $2,000 per mile in the case of the Cincinnati, Rockport & Southwestern and the Louisville, New Albany & St. Louis. The average per mile is $7,422 for main track and $3,998 for sidings.

Boston & Maine.

This company has begun to build a new depot in Portland, Me., near the old transfer depot.

Michigan Railroads in 1874.

The report of the Michigan Railroad Commissioner for 1874 gives some figures as to the earnings and traffic of the railroads of the State. Those given below include all whose earnings have not been published heretofore for the year ending December 31:

	Earnings.	Expenses.	Net earnings.	Earnings per mile.	P. c. of exps.
Chicago & Lake Huron	$345,399	$255,282	$90,117	$1,489	73.91
Chicago & Michigan Lake Shore	683,445	536,843	146,602	2,778	78.55
Detroit & Bay City	390,383	289,916	100,417	3,424	74.27
Detroit, Hillsdale & Ind	63,751	47,329	16,422	996	74.24
Fort Wayne, Jackson & Saginaw	277,223	180,805	96,418	2,772	65.22
Grand Rapids & Ind	1,175,883	759,203	416,680	3,510	64.56
Traverse City	25,102	15,783	9,349	965	62.76
Grand Rapids, Newaygo & Lake Shore	135,189	63,839	71,350	3,863	47.22
Hecla & Torch Lake	41,368	75,057	*33,689	10,342	181.44
Marquette, Houghton & Ontonagon	882,974	483,941	399,032	10,034	54.88
Michigan Lake Shore	84,804	59,137	25,667	1,488	69.73
Paw Paw	9,987	9,342	645	2,497	93.54
Saginaw Valley & St. Louis	112,434	51,310	61,124	3,307	45.64
St. Clair & Chicago Air L'e	18,689	12,233	6,456	1,168	65.46

* Deficit.

The work done for the year is reported for the following roads:

	Passenger Mileage.	Tonnage Mileage.
Chicago & Mich. Lake Shore	8,708,271	12,367,481
Detroit & Bay City	4,593,042	8,078,674
Fort Wayne, Jackson & Saginaw	3,051,301	.....
Grand Rapids & Indiana	12,623,086	25,872,854
Traverse City	239,842	.....
Hecla & Torch Lake	.....	1,038,400
Marquette, Houghton & Ontonagon	1,818,233	16,812,652
Saginaw Valley & St. Louis	870,927	1,194,013
St. Clair & Chicago Air Line	234,448	148,668

The mileage owned and capital accounts were as follows:

	Miles.	Stock.	Funded Debt.	Floating Debt.
Chicago & Lake Huron	232	$5,775,000	$5,140,000	$2,142,420
Chicago & Mich. Lake Shore	246	1,511,167	6,630,000	1,093,167
Detroit & Bay City	114	1,331,450	2,331,000	200,000
Detroit, Hillsdale & Ind	64	344,092	1,470,000	141,494
Fort Wayne, Jackson & Saginaw	100	1,151,000	2,000,000	222,268
Grand Rapids & Indiana	335	2,800,000	8,000,000	351,179
Traverse City	26	205,000	250,000	38,467
Grand Rapids, Newaygo & Lake Shore	35	533,000	576,000	223,738
Hecla & Torch Lake	4	100,000	.....	73,060
Marquette, Houghton & Ontonagon	82	2,306,600	5,456,000	769,899
Michigan Lake Shore	57	450,000	880,000	107,735
Paw Paw	4	75,000	15,000	10,000
Saginaw Valley & St. Louis	28	265,543	446,000	13,761
St. Clair & Chi. Air Line	20	.....	325,000	.....

The Marquette, Houghton & Ontonagon works six miles of leased road, making 88 miles in all; the Saginaw Valley & St. Louis six miles also, making 34 miles in all. The Traverse City road is worked by the Grand Rapids & Indiana, under a temporary agreement. The St. Clair & Chicago Air Line works only 16 miles of the 20 owned. Three of the roads were in the hands of a receiver, the Chicago & Lake Huron, the Michigan Lake Shore and the St. Clair & Chicago Air Line. The Detroit, Hillsdale & Indiana has been sold under foreclosure since the close of the year, materially altering its capital account. Not one of the roads in the list paid any dividend on the stock, and seven of them were and are wholly or partly in default on the interest on their debt. The capital account of the Marquette, Houghton & Ontonagon includes investments in mines and mineral lands, besides the actual cost of the road. It must be remembered that this table includes all the smaller and less productive roads, the earnings of all the leading lines having been given heretofore.

Atchison Bridge.

The Atchison (Kan.) *Patriot* says: "This magnificent structure approaches completion. But one span of the superstructure remains to be put in place, and that will probably be done by Saturday night. The span between the third and fourth piers was put up in three days. After the superstructure is all completed, the floor and rails will have to be laid, which can be done by August 10. The bridge will then be ready for the crossing of trains, provided the approaches and other matters be arranged. The celebration and formal opening will take place about September 1."

Later dispatches announced the completion of the last span August 4. The London *Engineer*, of July 23, has an illustrated description of this structure.

Grand Rapids & Indiana.

This company is building camp cars for pleasure and fishing parties. They are fitted up to accommodate nine persons, and provided with sleeping and cooking conveniences. The country on the northern part of the road is much resorted to by sporting parties, by whom, doubtless, these cars will be largely used.

Petersburg.

The whole of the old Board resigned with President Ragland, and the management has been entirely changed. The new Board is composed of several merchants and bankers of Richmond, and of Mr. Hiram K. Sibley, of Rochester, N. Y., who has owned a considerable interest in the road for some time. It is said that the new management does not represent any outside combination, but that the parties have taken up the road on their own account, believing that it can be made to pay.

The Rapid Transit Commission.

This Commission has had hearings nearly every day of inventors and other projectors of city railroads, whose names are legion and whose plans are of all degrees of goodness and badness and crudeness, especially the latter. On Tuesday of this week, Mr. Richard P. Morgan, Jr., who has worked energetically for many years on his project, presented his plan of a Gothic arch elevated railroad, such as is familiar to most of our readers, with plans, detailed estimates, and a model on a scale of ¾ in. to a foot, indorsed by many eminent engineers, including Mr. Linville, the President of the Keystone Bridge Company. Mr. Morgan makes a formal proposal to construct a first-class double-track railroad on his plan, entirely spanning the roadway, on any streets of New York, for $446,520 per mile, on streets 60 feet wide between curb lines; for $420,940 on 50 feet streets, for $396,820 on 35 feet streets, and for $386,260 on 30 feet streets, not including foundations and equipment. This road he would proportion for a rolling load of 1,200 lbs. per lineal foot, purposing to use 6-ton engines.

National Security and Improvement Company.

This new company purposes building a railroad from the Potomac, at Quantico, Va., westward by way of Harrisonburg to Beverley, in Randolph County, W. Va. The railroad is to be subordinate to the other interests of the company, and is intended mainly to develop large tracts of land and iron mines, which the company purposes opening up.

Iowa Pacific.

It is reported that this company, finding it impossible to raise money for the completion of the road, will turn it over to a new company to be organized shortly under the name of the Dubuque, Fort Dodge & Pacific Railroad Company.

Spartanburg & Asheville.

At the recent meeting the board of directors unanimously resolved to let contracts for the mountain section of the road at once.

A new election on the question of a county subscription to the stock was to be held in Buncombe County, N. C., August 5. A subscription was once voted, but it is alleged that there was some informality about the election.

Canada Southern.

At the annual meeting in St. Thomas, Ont., recently, it was stated that a large proportion of the floating debt had been funded in second-mortgage bonds at 75, thus closing many accounts which had been troublesome. Proposals from the Hamilton & Lake Erie for closer connections and a united effort to cultivate the local traffic with Hamilton were favorably received.

Memphis & Little Rock.

Mr. R. K. Dow, the agent for the trustees, who has been in possession of the road for some weeks, has been appointed Receiver by the United States District Courts for Arkansas and Tennessee.

New Castle & Franklin.

The extension of this road from the present terminus at Stoneboro, Pa., to Meadville is under discussion. Surveys have been made and the extension will probably be built, if the money can be secured.

Pennsylvania & Erie Coal & Railroad Company.

This is the name of a recently-organized company which purposes opening up the coal region of Elk County, Pa., and for that end will build a railroad to connect its mines with some existing line, probably the Philadelphia & Erie.

Fond du Lac, Amboy & Peoria.

The towns of Mayville and Hustisford, in Dodge County, Wis., have each voted $25,000 to this road. Mayville also voted to give the old grade and right of way of the Iron Ridge & Mayville Railroad which cost the town $20,000.

Alabama & Chattanooga.

Alabama papers report that the sale has been confirmed and that nothing remains but the payment of a certain part of the purchase money, which will soon be made.

It is said that arrangements are being made to put on a fast train from Chattanooga to Meridian, with a view of reviving the through business; but before this is done a great deal of money must be spent to put the road into condition.

Meetings.

The following companies will hold their annual meetings at the times and places given:

Indianapolis, Bloomington & Western, in Urbana, Ill., September 8.

Texas & Pacific, at the office of the company in Philadelphia, August 10, at 2 p. m.

Dividends.

Dividends have been declared by the following companies:

Pennsylvania 2 per cent. quarterly, payable August 31.

Cedar Rapids & Missouri River, 3½ per cent., semi-annual on the preferred stock, payable August 2; 1 per cent. on the common stock, payable August 2.

Arkansas Valley Town Company, $2 per share, payable August 2.

Iowa Railroad Land Company, 2 per cent., semi-annual, payable August 2.

Allegheny Valley.

It is proposed to build a branch line about 12 miles long from the Low Grade Division near Reynoldsville, southward to Punxsutawney, in Jefferson County.

Ligonier Valley.

The property of this company is to be sold at sheriff's sale August 9. The road is all, or nearly all, graded from the Pennsylvania Railroad at Latrobe southeast 10 miles to Ligonier.

Longwood Valley.

Work is said to have been begun on this road near High Bridge, N. J.

Erie.

The Court has made an order authorizing Receiver Jewett to settle the suit with the Jefferson Car Company. By the agreement of compromise the Erie is to pay to the car company $300,000 in twelve monthly installments, the costs of the suit, and to surrender all the stock of the car company held by the Erie Company. By the same order the Receiver is permitted to cancel the contract between the Erie Company and the National Stock-yard Company, on condition that Erie purchase all the outstanding stock of the stock-yard company in the hands of one Robinson, at the rate of $50,000 worth of the first mortgage bonds of the stock-yard company for 3,623 shares, also buying 1,822 shares of the stock-yard company held by Mrs. Fisk for $5,000 of the first mortgage bonds of that company. The Receiver is also to complete a contract with Robinson, whereby Erie is to obtain leasehold property in the vicinity of Eleventh avenue and Fortieth street, in New York, at an annual rent of $21,370, and is bound to pay to Robinson one-fifth of the net profits of all business done on the premises.

The new Portage Bridge is finally completed and was tested July 31, in the presence of a number of the officers of the road. The first engine to pass over was No. 131, after which two and then six heavy mogul engines coupled together were sent over. The test was made by the six engines, which with their tenders weighed about 65 tons each. The deflection in the 118 feet span was 0.066 foot, and in the 100 feet span was 0.04 foot, of which 0.016 foot was due to the compression of the towers. The test was pronounced satisfactory, and through trains have resumed their trips over the Buffalo Division, after a suspension of nearly three months.

The old bridge was burned May 6, and the contract for the new one let a few days afterwards. The new bridge is of iron, is 820 feet long and is 201 feet high from the top of the masonry piers to the rail, and about 235 feet in all. There are

six iron piers, or towers, each occupying 50 feet in length of the bridge. The bridge has 13 spans, one of 118 feet, two of 100 feet and 10 of 50 feet, six of which surmount the towers. The bridge was built by the Watson Manufacturing Company, of Paterson, N. J., from designs furnished by the engineers of the Erie Railway.

The London bondholders' meeting appointed a committee to protect their interests, at the head of which is Sir Edward W. Watkin, now Chairman of the Metropolitan, formerly Chairman of the Grand Trunk of Canada, and apparently a gentleman often called upon to manage the affairs of a British company sick unto death. He is to visit this country and do what he can for the interests of his constituents. The stockholders of the company at a meeting in London also appointed a committee. The thing for them to do, however, if they wish to get any return for their shares, is to subscribe money to pay the overdue interest and improve the road—which doubtless they will not do.

Perishable Freights over the Union Pacific.

The Chicago, Burlington & Quincy, the Chicago & Northwestern, and Chicago, Rock Island & Pacific railroad companies have issued the following notice in regard to the shipment of perishable property, household goods, and other property of doubtful value:

"As the Union Pacific Railroad Company require prepayment or guarantee of charges to destination on perishable property, household goods, and all property of doubtful value, we hereby give notice to all connecting lines that on and after August 1 next, we will not receive for transportation to points west of Omaha, household goods, perishable property, or property which in our judgment is not worth the transportation charges, unless the freight and charges are prepaid or guaranteed to destination."

Bath & Hammondsport.

This road, which has been under construction for a year past from the Erie at Bath, N. Y., through Pleasant Valley to Hammondsport, 10 miles, is completed and was opened for business with a grand demonstration, July 5. It is of three feet gauge, and has a grade as high as 132 feet to the mile. It furnishes an outlet to the celebrated grape-growing district around Hammondsport, and is expected to do a large excursion and passenger business in connection with the Lake Keuka steamboat line. Capt. Allen Wood, formerly connected with that line, has leased the road and furnishes the equipment.

Wilmington & Western.

Subscriptions are being raised along the line of the road to secure the building of the extension from Landenburg, Pa., westward to Elk Creek, about eight miles.

Vaca Valley.

This new road is nearly completed from the California Pacific at Vacaville, Cal., to Winter's, and trains were to be running by this time.

Atlantic & Great Western.

The Receiver's accounts, as filed with the Court, cover the period of three months and 20 days, from December 10, 1874, to March 31, 1875. For that period the operations of the road were as follows:

Actual earnings	$1,075,129
Working expenses (79.14 per cent.)	850,890
Net earnings	$224,239

The receipts from all sources and the disbursements, including those on the Receiver's account, for the four months and 20 days from Dec. 10, 1874, to April 30, 1875, were as follows:

Receipts	$1,868,617
Disbursements	1,798,003
Balance on hand April 30	$70,61

which is subject to a deduction of $26,502 for additional expenditures made. The disbursements include $258,761, paid in various sums on account of the rental of the Cleveland & Mahoning road. This was paid on the rental of the Cleveland & Mahoning only, and does not include the Niles & New Lisbon, or the Liberty & Vienna.

For six months ending May 31, the net earnings of the Mercer Mining & Manufacturing Company, whose shares are included in the leased line rental trust, were $18,905.

The operations of the Shenango & Allegheny road for the five months ending May 31, were as follows:

Earnings ($2,087 per mile)	$68,877
Expenses (62.35 per cent.)	42,944
Net earnings ($786 per mile)	$25,933

These net earnings are subject to a charge of $25,933 for accrued interest on Shenango & Allegheny bonds.

The committee of first-mortgage bondholders and Mr. James McHenry have compromised their differences, and now issue a single plan for re-organization, the characteristics of which are, that all the securities are to remain as they are, but the road is to be sold under foreclosure of the first and second mortgages and held in trust by the trustees for the benefit of the bond and stockholders, who will get whatever the road may earn net. The first-mortgage bondholders will get all the net earnings until these exceed the interest due them; then the second-mortgage bondholders will take the excess, etc. It is coupled with a plan of scaling down the interest of some of the securities, and of the leased line rental trust bonds, which may not be acceptable to the holders of the latter.

Chagrin Falls & Solon.

Steele & Palmer, contractors, of Cleveland, O., have offered to build this road, provided the people of Chagrin Falls will stake $10,000 stock, and will make them a donation of $20,000, payable in 30 and 60 days after cars begin running. The proposition will be accepted, provided the money can be raised. The road will be about five miles long, from Chagrin Falls southwest to the Cleveland & Mahoning at Solon.

Nevada County.

Work is now in progress nearly all along the line, only one section remaining to be let. Work on the tunnel is well advanced. The company hopes to have the road in running order from Colfax, Cal., to Nevada City by November.

Rutland.

At the annual meeting in Rutland, Vt., July 28, the annual report was presented, showing that the rental due from the Central Vermont was $282,000 in arrears and that the lessees refused to settle. Half the amount, however, would probably be recovered from money in the hands of the Cheshire and the Connecticut River roads. Finding it impossible to secure a settlement, the board had given the 30 days' notice required of a termination of the contract. The 30 days expired July 26, and the board purposed taking steps at once to secure possession of the road. The meeting passed resolutions approving the action of the directors and instructing them to continue the proceedings to recover the road and the rental due.

Connecticut Railroad Legislation.

The Hartford *Courant* thus sums up the work done by the Connecticut Legislature at its recent session: "The railroad matters of consequence are the bills incorporating the first-mortgage bondholders of the Air Line Railroad by the name of the Boston & New York Railroad Company, and incorporating the Providence, Ponagansett & Springfield Railroad Company with the privilege of town-bonding included. Payment of the taxes due from the Air Line and Connecticut Western and Valley roads was suspended for two years, and a supplemental bill was passed giving the State a prior lien on roads whose taxes are in arrears. The Goodwin investigation occupied considerable time, resulting in a refusal of the Legislature to accept the annual report of the Railroad Commissioners, on account of manifest errors."

New Jersey Midland.

It is reported that the receipts are in excess of the expenditures, the freight business is steadily improving and the milk traffic is good, though this Summer's passenger travel has been smaller than was expected. A gravel train is to be put on to widen out some of the cuts and to continue the work of filling up the trestles. The road-bed is now in very fair condition, much better, indeed, than was to be expected, considering the embarrassed condition of the company.

St. Louis, Kansas City & Northern.

The effort to send all the Eastern business of the Kansas Pacific over this road has been abandoned and President Carr, of the Kansas Pacific, announces that the traffic contract between the two companies has been annulled. This effort caused a very lively contest for a short time and passenger and freight rates were very freely cut by both the other lines east from Kansas City, the Missouri Pacific and the Hannibal & St. Joseph. It is now stated "that the Kansas Pacific desires friendly relations with all the lines."

Northern Pacific.

The sale of the road, which was to have taken place in New York August 2, has been adjourned to August 12.

At the bondholders' meeting in New York, July 29, it was voted unanimously to confirm the nomination of Charlemagne Tower as a trustee under the general mortgage, in place of Wm. B. Ogden, resigned.

It has been stated that nearly two-thirds of the bondholders have agreed to join in the plan of reorganization prepared by the committee and in the purchase of the road by the purchasing committee.

During the month of June there were sold at Tacoma, Washington Territory, over $400,000 worth of the land grant in that Territory. A single sale amounted to $115,000, another to $100,000, a third to $80,000 and two to $40,000 each. These purchases were all made with bonds, which, being obtainable at 18 or 20 cents on the dollar, bring the timber lands down to a figure below the Government price.

Central Vermont.

The examination of the trustees' accounts progresses slowly, and threatens to be an interminable affair. But little progress has yet been made.

New Haven and Northampton.

A special meeting of stockholders has been called at New Haven, August 10, to vote on the amendment to the charter requiring the establishment of a depot at Plantsville. This meeting is called under the clause of the general law, which provides that no amendment to a company's charter shall become operative unless it shall be accepted by the stockholders at a meeting called for that purpose within six months after its passage. It is said that the company desires to take advantage of this provision, in order to evade the recent act obliging it to restore the Plantsville depot.

Hoosac Tunnel Line.

The Springfield *Republican* says: "The committee of the Executive Council appointed to locate the new route of the Troy & Greenfield Railroad into Greenfield have selected from the five routes surveyed the one which leaves the old line at Blakely Hollow, and enters the present depot grounds, running through the north side of the agricultural grounds. The location of the depot has not been decided upon yet, the council asking for further estimates of the cost of a union depot, north of the present one, and near the coal-sheds. A decision will not be made under two weeks.

Perkiomen.

The tunnel through the Lehigh Mountain on the extension of this road to Emaus, Pa., is nearly done and will, probably be open in September. It is 1,850 feet long, 22 feet high, and is made wide enough for two tracks. About 200 men are at work in the tunnel. Judge Reilly, of Pottsville, is the contractor.

Duck River Narrow Gauge.

This company is trying to induce the Nashville, Chattanooga & St. Louis to indorse its bonds, and thus enable it to extend its road to Fayetteville. A committee of the board of the Chattanooga Company is investigating the matter.

Mackinaw & Marquette.

A number of railroad men interested have been examining the line of this road. It is said that contractors have offered to build the road and begin work at once.

Washington, Cincinnati & St. Louis.

President Borst has contracted with the State for the labor of 300 convicts, who are to be employed in grading the section ending at Monterey, in Highland County.

Kansas City & Keokuk.

A party of Englishmen, said to represent a large amount of capital, have been inspecting the line of this road with a view to advancing money for its completion.

Buffalo & Jamestown.

Work is in progress on the eight miles of road between Kennedy and Jamestown, most of which is very light. The passenger business is very good, but not much effort will be made to secure through freight until the track is completed to Jamestown and a transfer depot built there.

Somerset.

The contractors on the extension of this Maine road having suspended work on account of the haying season, the company has taken steps to re-let the work.

Marietta, Pittsburgh & Cleveland.

The trouble with the Post-office Department has been settled, the department having agreed to have the mails over the road reweighed, and a new average adjusted. The company claimed that the weight upon which the present compensation is based was taken during a month which did not give a fair average of the amount carried.

Chicago, Rock Island & Pacific.

Reports, which have been current for some time, to the effect that the Southwestern Division was to be extended from Plattsburg, Mo., to Kansas City, have been contradicted, apparently by authority.

Atchison, Topeka & Santa Fe.

Contrary to previous statements, this company has failed to make a satisfactory arrangement for the use of the St. Louis, Lawrence & Western track from Lawrence, Kan., to De Soto, for the new Midland line. A new track will therefore be built for this 15 miles. The surveys are being made, and it is to be built as fast as possible.

Maysville & Lexington.

Under a decree of the United States Circuit Court in the suits of J. B. Alexander and C. B. Childs & Co. against this company, the United States Marshal will sell at public sale in Maysville, Ky., August 31, the Maysville & Lexington Railroad, Northern Division. The sale will include the road from Maysville to Paris, 49.6 miles, the franchises, real estate, depots, shops and other property, and the equipment, which consists of three engines, four passenger, two baggage and mail, nine box, twenty coal and flat and a number of hand and rubble cars. Of the purchase money, $25,000 must be paid, in gold, at once, one-third of the balance in 30 days and the rest in three equal installments, in six, 12 and 18 months. The purchaser must give good bonds and pay 7 per cent. interest on the deferred installments, the Court retaining a lien until the purchase money is paid in full.

All claims against the company, to share in the proceeds of the sale, must be presented to H. P. Whitaker, Commissioner, at his office in Covington, Ky., on or before August 25.

Detroit, Hillsdale & Indiana.

The parties who bought this road at the foreclosure sale have reorganized the company under the name of Detroit, Hillsdale & Southwestern. The road will hereafter be called by this name.

New York, Kingston & Syracuse.

The name of the reorganized company is to be the Ulster and Delaware Railroad Company, and the road is already called by that name.

Pennsylvania.

The newly completed Hanover & York road with the recently leased Littlestown and Frederick & Pennsylvania Line roads are now worked as one line, under the name of the Frederick Division. The new division is 56 miles long, from York, Pa., southwest to Frederick, Md. The stations and distances from York are as follows: Bair's, 7 miles; Jacob's Mills, 15; Hanover, 19; Littlestown, 27; Taneytown, 33; Ladiesburgh, 41; Woodsboro, 45; Frederick, 56.

The directors, following the suggestion made at the last annual meeting, have resolved to pay dividends hereafter quarterly, instead of half-yearly. The first quarterly dividend (2 per cent. again, as it was last spring) has been declared and will be paid August 31 to stockholders of record July 31. The transfer books, however, will remain open.

Pullman Palace Car Company.

This company will pay the outstanding bonds of the issue of $1,000,000 8 per cent. bonds, first series, due November 15, 1875, at any time prior to that date, with accrued interest, on presentation at the office of the Farmers' Loan & Trust Company in New York.

Paducah & Memphis.

A cross bill has been filed by Martin Kelly, a contractor, to enjoin the counties along the line and the First National Bank of Memphis from paying over to the company any of the county bonds issued or to be issued until the claim of Mr. Kelly is settled.

Central, of New Jersey.

A contract has been let to Mr. A. F. Beach for the construction of a branch line from the Lehigh & Susquehanna Division up Sandy Run to connect with the Buck Mountain, Eckley and Drifton collieries. The new branch will be about 12 miles long and will have grades of 85 feet to the mile. The collieries named produce about 500,000 tons per annum, all of which is now shipped over the Lehigh Valley.

Hot Springs Branch.

The grading is completed for nine miles, and the bridges and trestles for eight. The first engine was expected last week. Many of the ties have been gotten out, and tracklaying will soon be begun.

Springfield & New London.

The Springfield (Mass.) *Republican* says: "The city seemingly has a better prospect, at present, of being speedily furnished with direct railroad connections with Providence and New London than at any previous time, as President Bill of the Longmeadow Railroad, Mayor Wight, and several of the directors seem determined, if possible, to secure these connections immediately on the completion of the Longmeadow road. It is the general feeling among the officers of the latter road that some understanding should be reached with the New London Northern and Ponegansett roads in reference to their intentions regarding these connections, and matters are reported as taking a very favorable turn. The New London Northern Railroad Company has always signified its willingness to do its part by extending the line from Stafford Springs to meet the Longmeadow road at the State line, as soon as it was certain of thereby gaining connections with the great through roads. The Longmeadow Railroad now only wants the assurance of the speedy consummation of the New London Northern road's plans to bring the road into the city independent of the Athol line. As each of the roads seems to be waiting for the other, the sooner they come to an understanding the better."

Green Mountain.

The surveys of the north end of this proposed road have been completed and the line connected with the Vermont Central at Middlesex. The engineer, Mr. Sprague, reports a very feasible route up the White River and down the Mad River, the grades being easy and the work light. The people along the line are taking much interest in the project.

North Brookfield Branch.

The grading is progressing well and the force is being increased. The contract for furnishing the ties has been given to A. & E. D. Bacheller, who also furnish ties for the Boston & Albany road. The Chief Engineer is Samuel N. Keith, of Providence, R. I.

Massachusetts Central.

The Springfield *Republican* says: "The appearance of a surveyor in Lee prospecting for a railroad route from Northampton through Berkshire to Boston Corner, thus connecting the Massachusetts Central with the Poughkeepsie & Eastern Railroad, has put new life into the Lee & New Haven and Lee & Hudson roads. It seems that this project has been concocting for some time with the directors of the Massachusetts Central, who have so far examined the route as to pronounce it feasible, and have published a circular containing a map of the proposed road, claiming that it brings Boston 105½ miles nearer to the coal fields than by any existing route."

New York Central & Hudson River.

The transfer books are to be removed to the office of the Treasurer at the Grand Central Depot in New York, where they will be opened August 16, having been closed preparatory to their removal July 29.

Western Maryland.

Shipments of coal over this road from the Chesapeake & Ohio Canal at Williamsport, Md., have been begun, and are increasing.

The purchase of the ground for the depot, engine and yard at Williamsport has been completed, and work on the buildings has already been begun.

The Pennsylvania's Preparations for the Centennial.

The Philadelphia *Ledger* of July 29 says: "The Pennsylvania Railroad Company has completed a plan for the arrangement of the tracks at the Centennial grounds. The great number of trains which the occasion will demand make it imperative that the arrangements shall be such that they can be handled with safety to life and limb, with dispatch, and without the

customary drilling. It is hoped that the following plan will meet these requirements:

"Elm avenue is the southern boundary of the Park and the Centennial grounds. Belmont avenue intersects it and passes between the main Exhibition building and machinery hall. Parallel to machinery hall, on the opposite (south) side of Elm avenue, the company will erect a depot 650 feet long by 100 feet deep, which will contain no tracks, but will be simply for the accommodation of passengers. The eastern end of this depot will extend to the corner of Elm and Belmont avenues, but will be about 200 feet west of it. On Belmont avenue, south of Elm, a large temporary hotel will be erected by private parties, the grounds for which are 900 feet front by 240 deep, and do not reach the intersection of the two avenues by about 200 feet.

"The main tracks of the Pennsylvania Railroad cross Belmont avenue at its intersection with Girard avenue, and are below the grade of those streets. A short distance above their intersection they will branch off into the new yard to be constructed. They will be laid in the form of a circle, about 1,000 feet in diameter, flattened on the Belmont avenue side. Three tracks will be laid around this circle, and will be used respectively for arriving and departing trains from New York, Baltimore, and Washington. The trains from Jersey City will be run direct to the Centennial grounds. They will reach them on the north track, and then switch into the yard. In case of three trains arriving at once, they will run from the main track and be switched, one upon each of three tracks composing the circle, the trains stopping on the Belmont avenue side in such a way as not to overlap each other.

"Two passages through the hotel, fifty feet wide each, located about 200 feet from either end of the building, will allow the passengers to reach Belmont avenue, and the corner of the two avenues, which will have no buildings upon it, will be floored over, making a wide passage to the intersection, where there will be a large concourse for the street cars.

"The trains during the day will run on such time that arriving trains can be immediately reloaded, and for this purpose they will proceed around the circle until they are in the rear of the depot building, on Elm avenue.

"To prevent confusion and mistakes in regard to the destination of trains, passage-ways will be built from the depot to each of the three tracks, and the passengers will thus be assorted before they reach the cars. Three sheds will be built at the sides of the three tracks, but not covering them, to shelter the arriving and departing multitude from the weather. These will be each 1,650 feet long.

"Trains from Lancaster, Harrisburg and the West will strike the circle at nearly the same point as trains coming from the Mantua side, and will go in upon the New York track, running around in the same direction.

"Trains which do not depart immediately after their arrival will go around the circle and be backed upon some of the fourteen sidings which will be built just north of the main tracks. The engine will head east and will not leave its train, but at the proper time for departure will again be put upon the circle. Departing trains will always reach the main track from the circle headed in the direction they are to proceed, so there will be no danger from backing trains.

"West of Fiftieth street several sidings will be built to carry out empty boxes from the Exhibition buildings, and the Commissioners will erect structures at that point for storing them. The tracks now running through the buildings will remain during the Exhibition. There will be over seven miles of tracks in this yard.

"Regarding the number of passengers for whose transportation provision must be made, there can be only conjecture. The Centennial Commissioners have named 5,000 daily from the New York Division of the road. It is calculated that a train can be unloaded at this yard every three minutes. Trains of 15 to 20 cars can be run with one engine on the New York Division; of about 12 cars on the Western Division, and probably from 20 to 25 cars from the South."

Syracuse Northern.

This road was sold at auction in Syracuse, N. Y., July 31, under foreclosure of the third mortgage of $200,000. The sale was subject to the first mortgage of $500,000 and the second mortgage of $400,000. It was bid off for $240,000 to Mr. Marcellus Massey, President of the Rome, Watertown & Ogdensburg Company, which had arranged to secure control of the road some time ago. The road is 45 miles long, from Syracuse northward to the Rome, Watertown & Ogdensburg at Sandy Creek. The bonded debt remaining upon it is $20,000 per mile, and the purchase money is $5,333 per mile additional.

Chicago Union Depot.

The Chicago *Tribune* of July 30, says: "The much-talked-of lake-front depot question is now in a fair way of settlement, and there is every prospect that a large and magnificent union depot will be erected on the lake-front at once. But this depot will not be built on the city's grounds between Madison and Randolph streets, but at the place where the present depot stands. Since the fire that portion of the city has completely changed, and residences have given place to large business houses. No opposition to leasing the property was made by any one. The depot will be extended 30 feet east, towards the lake, and 100 feet south to the line of Randolph street. The only thing yet necessary to complete the arrangement is to provide additional freight accommodations for the Michigan Central, as the 30 feet to be added on the east is occupied by the tracks of this road leading across Water street to its present depot, which would have to be vacated. The Michigan Central would be willing to accept the site on which the present freight depot of the Baltimore & Ohio stands. If the latter road consents to vacate and accept another site, all the obstacles in the way of the new arrangement are done away with, and as the Baltimore & Ohio needs a passenger depot more than any of the other roads, it will undoubtedly make the sacrifice."

Chicago & Northwestern.

Under date of July 18, our Amsterdam correspondent writes: "In Chicago & Northwestern preferred stock the purchases continued. For three months the same banker, a correspondent of a New York firm, has bought all that came on the market. This week the prices were all the time 1¼ lower than in New York. The same is the case with the West Wisconsin bonds; they are bought daily by the same broker, and it is suspected that when these purchases are finished a more favorable proposition for payment will be made by the company."

Anderson, Lebanon & St. Louis.

At a meeting held July 28, the board of directors resolved to cancel the old issue of bonds and to make a new one of $1,500,000. These bonds, the directors expect, will be immediately taken up, and the proceeds will enable the company to complete the section between Anderson, Ind., and Lebanon, which is partly graded.

Lafayette, Muncie & Bloomington.

On behalf of the State of Indiana, the Prosecuting Attorney has begun proceedings in the Circuit Court at Frankfort, Ind., in the nature of a *quo warranto*. The Court is asked to declare the franchises of the company forfeited and to appoint a receiver for the property.

St. Paul & Pacific.

Our Amsterdam correspondent writes that the bondholders' protection committee had sent secretly their Secretary, John Carp, to this country, to endeavor to make arrangements with the company, though a financial agent there; *The Kapitalist*, announced the fact soon afterwards. In the latter part of the week ending July 17 there were enormous purchases of the bonds in Amsterdam, main and branch line and extension bonds. The quotations for that week show a rise from 16¾ to 19 for Main Line bonds, 35⅛ to 40½ for Branch, while for Vincent and Brainerd extensions the price was pretty steady at 16¾.

Boston, Hartford & Erie.

In the United States Circuit Court in Boston, July 27, a decree was rendered to the effect that the Commonwealth of Massachusetts has no valid claim of any sort upon the surplus of £16,273 sterling, now in the hands of Baring Brothers, of London, and remaining from the sale of bonds of the road, the bonds having been delivered to the complainants by the corporation for that purpose.

Muncy Creek.

The grading of this road has been for some time completed from the present terminus at Hughesville, Pa., for several miles. It is now proposed to lay the track from Hughesville to Tivoli, two miles, with wooden rails, which, it is believed, can carry the traffic, for the present at any rate.

Grand Trunk.

In answer to the recent attacks on Canadian railways in the English papers, Mr. C. J. Brydges has addressed a letter to Mr. Mackenzie, officially. He says that it has been proven by reports and documents of the Grand Trunk Railway Company that the statement that upwards of £30,000,000 of English capital has been hopelessly sunk in this railway is not true. It has been shown that the actual cash sent from England and expended in building and completing the line has been less than £12,000,000, and that a net profit was earned in 1874 of £460,000, or 4 per cent. upon the actual cash expenditure upon the Grand Trunk Railway. It has been proven that the statement that only £80,500 was divided among the English shareholders in 1874 was not true, the amount of £460,000 having been earned and paid, according to the company's own statements. It has been proven that the Great Western Company has paid from its net earnings during 21 years an aggregate amount for interest on bonds and dividends on shares held in England of not less than £4,640,000, or an average of £221,000 a year. It has been proven that the Northern Railway has not wiped out its share of the capital; that it is regularly paying the interest upon its bonds, which are all held in England, and that any portion of its capital which is not paid upon is almost entirely held in Canada.

The letter concludes as follows:

"That an attack so violent, so unnecessary and so generally unwise, should have had so absolute a want of foundation to rest on, seems almost incomprehensible. The attack has been so obviously false and overdone, that it can only recoil on its author, and unfortunately must do so also upon the company of which he is President. With the recovery of the trade of this continent from its present depression, Canada will provide a fair rate of interest upon the actual cash outlay expended by English capitalists in constructing railways by private companies. The construction of rival lines is almost entirely being done by Canadian capital and credit. They are nearly all feeders to existing lines, developing for the benefit of the whole country and its industrious population, and the wealth of the Dominion."

Stockton & Copperopolis.

The bondholders' protection committee (B. Levi, A. Goetz-Rigaud, S. Raunheim, Dr. D. Sauerlauder and J. L. Wiesche) have issued a circular dated June 26, which announces the following arrangement: Every old 8 per cent. bond for $1,000 is to be exchanged for a new 5 per cent. bond for $500, interest payable half-yearly, and the principal in 30 years, the payment of both interest and principal being guaranteed by the Central Pacific Railroad Company, whose indorsement will be made on every bond. The Central Pacific has been the lessee of the Stockton & Copperopolis from the beginning, or nearly, but we believe that it had no engagements whatever to the bondholders at present. The committee report the circumstances which led them to approve of the contract finally made as follows:

"The causes which have led us to consider this arrangement as a favorable one are the following: Accurate information obtained on the spot has shown that it would not be possible to make the Stockton & Copperopolis Railroad profitable as an independent line under existing circumstances. The prosperity which the road enjoyed during the first years of its existence had its origin mainly in the important mining industries—especially the working of copper mines—which at that time had attained very great importance in this part of California. This industry was not at all permanent, however. The importation of Chili copper, soon established, made the copper mines of Copperopolis unprofitable; and with this the district, which hitherto had justified the most sanguine expectations, lost the greater part of its importance. As has often happened in America, the greater part of the population collected in such neighborhoods disappears as rapidly as it appears, and the industries undertaken, as well as the new cities founded at the same time, are abandoned and left to decay. Such a fate befel the district on the Stockton & Copperopolis Railroad. If it ran through a country which had other and productive resources aside from mining, such as timber and grain, even then the working of the road independently with profit would not be practicable, because the working expenses could no longer be brought into the proper relation to receipts so much diminished by the falling off of the ore traffic. Moreover, it must be counted as a disadvantage that the road is a branch line, connected with the great channels of traffic only through the Central Pacific Railroad; it is thus made wholly dependent upon the latter line, since that road can at will obstruct the forwarding of its freight.

"Under such circumstances we thought it advisable to strengthen and take advantage of the disposition of the Central Paific Railroad, at first only very slightly disposed to rent the Stockton & Copperopolis Railroad, and to induce it at the same time to undertake a guarantee in favor of the bondholders. This seems to us to have succeeded completely, and though on account of the condition of the affair forbidding the attainment of greater advantages, we will be able to confirm to you only a materially reduced claim; on the other hand, we have the satisfaction of delivering to you bonds of the known position of the great Central Pacific Railroad, whose security, according to all human foresight, rests on the best foundations."

The committee is of Germans, nearly all the bonds being held in Germany, having been sold in Frankfort.

Northern Colonization.

The Toronto (Ont.) *Nation* says: "It was with something like a shout of triumph that party journals proclaimed that Sir Hugh Allan had failed to raise the funds in England to build the Northern Colonization Railroad. No doubt it was the man, not the scheme, that was hated; but in their eagerness to hit an enemy, no distinction was made between the two, and consequently both suffer. The failure of the railroad, however, is a matter of importance to the public. It was a road projected to open up our back country, and it was thought of such consequence that on the strength of its construction the Government undertook the responsibility of building the Georgian Bay Branch Line. Whether they will proceed with the Branch now that the trunk is dead, is a pertinent question for the taxpayers of the country to ask. That the trunk is dead or dying appears certain. Any chance of recovery from the effects of its treatment in London seems to be dispelled by its treatment in Montreal. It was put before the English financiers as an honest, paying undertaking; it is exposed to the Canadian public as something like a swindle. Out of nineteen shareholders who subscribed for $250,000 worth of shares sixteen paid up between them only $18,881, and three owning over $30,000 shares paid nothing. Six municipalities subscribed for $1,251,000 worth of shares; five paid upon their subscriptions nothing, and one, Montreal, paid 50 per cent., or $511,260. The Montreal City Council has, we believe, refused to pay up any more of its subscription until the other shareholders, individual and municipal, pay up at least 50 per cent. of their subscription. But what if the defaulters refuse? What if further payments only represent further loss? The exposure illustrates an unpleasant feature in the way we build railroads. The men who get up and control such schemes have often apparently but one object in view, namely, to put as little money as possible into them, and to take as much as possible of other people's money out of them. This is not a satisfactory way of constructing our public works."

ANNUAL REPORTS.

Flint & Pere Marquette.

At the close of the last fiscal year, December 31, 1874, this company owned the following lines:

	Miles.
Main Line, Monroe, Mich., to Ludington	283.02
Flint River Branch	14.47
Bay City Branch	12.35
St. Clair Branch	3.94
Total main track	283.78
Sidings	44.75
Total	328.53

Of the main line, 48 miles, from Reed City to Ludington, were not completed until just at the close of the year and did not contribute to the business of the line at all.

The equipment consists of 42 engines, two of which are to be rebuilt; 31 passenger, including two parlor and two sleeping cars; 10 baggage, mail and express cars; 289 box and stock, 428 platform and 6 way cars; 24 gravel dump, 7 boarding cars, 1 pay, 1 derrick, 1 pile driver, 75 hand and 64 lorrie cars, and 25 snow plows.

The property is represented as follows:

Capital stock ($13,832 per mile)	$3,928,200
Funded debt ($22,778 per mile)	6,468,980
Total ($36,609 per mile)	$10,397,180

There are bills payable amounting to $1,323,342.52. The company has a land grant of 511,502.20 acres, of which 257,963,185 acres had been sold up to the close of the year, leaving 254,139,015 acres unsold. The total proceeds of land sales had been $2,115,865. The trustees report for 1874 receipts of $320,113.57, bonds to the amount of $184,000 canceled during the year, and $322,643.38 on hand at its close, of which $295,069.84 was applicable to the purchase and canceling of bonds. The company owns $80,000 of its bonds. The Land Commissioners' expenses, office and engineering, were $14,603,10. The land is held in five separate trusts each as security for one of the series of first-mortgage bonds.

Expenditures on construction account were $621,565.69, of which $457,521.99 was for the completion of the road to Ludington.

The earnings of the road for the year were as follows:

	1874.	1873.	Inc. or Dec.	P. c.
Passengers	$381,851 61	$426,797 22	Dec.. $44,915 61	10.5
Freight	600,358 98	635,772 21	Dec.. 35,413 23	5.6
Express and mail	36,326 47	27,097 59	Inc.. 9,228 88	34.1
Rent and interest	45,448 91	36,560 62	Inc.. 8,888 29	24.3
Total	$1,063,985 97	$1,126,197 64	Dec.. $62,211 67	5.5
Work'g expenses.	668,995 42	710,505 21	D..c.. 41,509 79	5.9
Taxes	23,443 78	24,544 33	Dec.. 1,100 55	4.5
Total	$692,439 20	$735,049 54	Dec.. $42,610 34	5.8
Net earnings	$371,546 77	$391,148 10	Dec.. $19,601 33	5.0
Gross earn'gs per mile	4,586 14	4,772 02	Dec.. 185 88	3.9
P. c. work'g exps.	62.88	63.09	Dec.. 0.21	....
P.c. expenses and taxes	65.08	65.27	Dec.. 0.19	....

The interest and coupon accounts for the year amounted to $480,987.01.

The operations of the road were as follows:

	1873.	1874.	Inc. or Dec.	P. c.
Number of passenger carried	492,365	465,518	Dec.. 26,847	5.5
Number of tons of freight	370,778	347,646	Dec.. 23,132	6.2
Lumber in feet, board measure	96,094,000	86,675,000	Dec.. 9,419,000	9.8
Staves	2,859,200	2,377,000	Dec.. 481,600	16.8
Shingles	171,660,000	257,640,000	Inc.. 85,980,000	50.1
Laths	5,940,000	5,520,000	Dec.. 420,000	7.1
Wheat, lbs.	11,161,185	14,504,400	Inc.. 3,343,215	29.9
Agricultural products, lbs.	50,648,142	35,434,700	Dec..15,213,442	30.4
Products of animals, lbs.	4,669,610	6,700,000	Inc.. 2,030,390	43.5
Merchandise, lbs.	153,783,008	169,627,700	Inc.. 15,844,692	10.3
Salt, bbls.	261,679	115,802	Dec.. 145,877	55.7
Plaster, tons	1,862	1,595	Dec.. 267	14.3
Logs, in feet, board measure	12,901,826	6,533,930	Dec.. 6,367,896	49.0
Total weight of all freight, in tons	370,778	347,646	Dec.. 23,132	6.2

The report of the General Manager, Mr. H. C. Potter, sums up the operations of the year as follows:

"The Western Division, from Reed City to Ludington, 48 miles, graded and tied the previous year, was fully completed in December, 1874. This finishes our construction work as planned, and gives us a rail-and-lake route from Manitowoc or Sheboygan, Wis., about 150 miles shorter than the all-rail lines.

"About 15 miles of steel rail were laid on the main line between Mount Morris and Grand Blanc, and in the yards at Holly, East Saginaw and Flint.

"Three miles of low track on the Bay City Division were raised about five feet, and placed beyond risk of damage or obstruction from freshets on the Saginaw River.

"The gross earnings of the year were $1,063,985.97, and the operating expenses $668,995.42, or 62.8 per cent. Earnings were at the rate of $4,586.14 per mile of operated road, and were a decrease, as compared with 1873, of $62,211.67. The operating expenses were less by $42,607.62 than those of 1873.

"The passengers carried were 465,518, as against 492,365 in 1873.

"The total tonnage was 347,646, against 370,778 in 1873.

"The transportation of lumber has been as follows:

In 1872	82,695,000 feet.
In 1873	96,094,000 feet.
In 1874	86,633,000 feet.

"The lumber drawn from the Saginaw River proper has increased from 9,000,000 feet in 1872 to 24,000,000 in 1873, and as the total product of the river in that year was 574,632,000 feet, it will be seen that great increase of rail shipments may be looked for from this district. * * * *

"In the Land Department, sales for the year were 8,214

acres for $96,287, an average, deducting amounts received from sales of timber, of $10.89 per acre. The collections of that department were $276,605.94. The land bonds paid and canceled were $208,500.

"The aggregate of land-grant bonds paid and canceled Jan. 1, 1875, is $1,426,500.

"The prospects for increase of traffic are good. The road now has the following valuable connections, and is exchanging traffic at the points named with all the lines named:

At Monroe with the		Lake Shore & Michigan Southern.
" Carlton	"	Canada Southern.
" Wayne	"	Michigan Southern.
" Plymouth	"	Detroit, Lansing & Lake Michigan.
" Holly	"	Detroit & Milwaukee.
" Flint	"	Chicago & Lake Huron, which connects at Sarnia with the Great Western and the Grand Trunk of Canada.
" Saginaw	"	Jackson, Lansing & Saginaw.
" Reed City	"	Grand Rapids & Indiana.

"The growing volume of lumber traffic for southern and eastern points is making these several connections more valuable."

Quincy, Missouri & Pacific.

This company owns and works a line from West Quincy, Mo., westward to Kirksville, 70 miles. For the year ending Dec. 31, the earnings were as follows:

	1874.	1873.	Inc. or Dec.	P. c.
Freight	$66,149 33	$58,511 04	Inc $7,638 29	13.1
Passenger	31,211 48	26,736 80	Inc 4 474 68	16.7
Mail, express, etc.	9,790 26	7,491 45	Inc 2,298 81	30.7
Total earnings	$107,151 07	$92,739 29	Inc ... $14,411 78	15.5
Expenses	80,100 91	85,549 00	Dec... 5,448 09	6.4
Taxes	10,564 28	.....	.....	....
Total expenses	$90,665 19	$85,549 00	Inc $5.116 19	6.0
Net earnings	$16,485 88	$7,190 29	Inc $9,295 59	129.3
Gross earn. per mile.	1,530 73	1,324 85	Inc 205 88	15.5
Net " "	235 51	102 72	Inc 132 79	129.3
Per cent of expenses..	74.76	92.25	Dec.... 17.49	19.0
Per cent of expenses and taxes	84.61	.....	.....	....

The President's report says: "The indebtedness of the company remains substantially the same in amount as it was one year since. No bonded securities have been sold, and the company has been solely dependent upon the earnings of the road to meet current expenses. The reports submitted herewith show that all accruing accounts for operating the road have been promptly met; that an encouraging increase in the earnings has been realized, and that the net income has been largely in excess of 1873. * * * *

"While it must be admitted that the present income from your property does not yield such a return as the capital invested demands, yet we must bear in mind that the enterprise is scarcely more than begun; that but little more than one-fourth of the road is now in operation, and that we may feel certain, in view of the fact that a line of only 70 miles is doing as well as it is, that the completed road of 255 miles would be a most excellent property. I am satisfied that our road is doing even much better than roads of similar length in the Western country. We have as yet no traffic except such as is afforded by the ordinary products of a country, rich and fertile, it is true, yet at this time but partially developed, and, while our business has rapidly increased in volume, yet we have not the advantage as yet of that steady stream of traffic from coal transportation, which is so sure and so great a source of revenue to some of even the shorter lines.

"An extension of less than six miles will bring us into one of the richest coal fields in the Western States, and when that is completed we may look for a substantial increase in our earnings, as well as a considerable decrease in our working expenses, by the cheapening of our fuel. * * *

"You are probably aware that during the past year the Directory has been unremitting in its efforts to close certain negotiations looking toward the settlement of the liabilities of the company, and the completion of the road to its western terminus. While I am unable, for reasons apparent to all, to enter into the details of these negotiations and explain the features of the same, I can, however, assure you that we have every reason to be encouraged as to its ultimate success."

Evansville, Terre Haute & Chicago.

This company owns and works a line from Terre Haute, Ind., northward to Danville, Ill., 55 miles. It is part of a pretty direct line from the Ohio River at Evansville northward to Chicago.

The equipment consists of 7 engines; 4 passenger and 2 mail and express cars; 89 box, 12 stock, 23 platform, 157 coal, 3 caboose cars; 1 wrecking, 6 hand and 4 push cars. Of these 20 box and 14 coal cars were bought during the year.

At the close of the last fiscal year, April 30, 1875, the capital account was as follows:

Stock ($7,718 per mile)	$424,491 06
Bonded debt ($20,000 per mile)	1,100,000 00
Floating debt, bills payable ($1,637 per mile)	91,150 78
Total ($29,375 per mile)	$1,615,641 84

The earnings for the year were as follows:

	1874–5.	1873–4	Inc. or Dec.	P. c.
Passengers	$55,547 53	.....	.....	....
Freight	168,564 84	.....	.....	....
Mail, express, etc.	12,156 36	.....	.....	....
Total	$236,268 78	$216,737 06	Inc... $19,531 72	9.0
Working expenses	122,179 74	124,808 21	Dec.. 2,628 47	2.1
Net earnings	$114,089 04	$91,928 85	Inc.. $22,160 19	24.1
Gross ear. per mile	4,295 61	3,940 67	Inc.. 354 94	9.0
Net " "	2,074 35	1,671 43	Inc.. 402 92	24.1
Per cent of expenses..	51.71	57.59	Dec.. 5.88	10.2

There was a very considerable falling off in the coal traffic, which forms the largest part of the freight business. The decrease was mainly in the block coal from about Brazil, the mines on the line of the road having done very well.

The income account was as follows:

Net earnings		$114,089 04
Collections on capital stock		9,307 30
Sales of second-mortgage bonds		67,425 00
Total receipts		$190,821 34
Interest account	$88,183 62	
Construction account	33,556 21	
Bills and accounts for previous year	59,250 28	
Repaid Treasurer's advances	9,831 23	
		$190,821 34

Of the expenditures on construction account, $17,000 was for new freight cars, the balance for road and buildings. During the year 100 tons of steel rails were laid, 12 miles of fence built, a new depot built at Gessie, and several new sidings laid.

When the road was first opened, a contract was made with the American Express Company at $100 per mile per annum. That company, however, sent only local business over the road, and no through business, as was agreed, and then complained of losing money. A concession in price having been refused, the express line was withdrawn May 1 last, and the company has since done its own express business with good results.

When the Chicago, Danville & Vincennes went into the receiver's hands, there was due this company for freight $17,689.98, of which only a small part has yet been paid.

The Michigan Central's Policy in Leasing Branches.

The remarks of President Joy in the report of the Michigan Central for the last year are devoted to further explanations of the causes which have rendered the company unable to earn and pay dividends of late. The first part treats of the effect of the great reduction of rates, and absolute necessity, with such rates, to have the best possible road and equipment to enable it to earn working expenses even—a subject which we discussed at length a year ago, and about which there can hardly be two opinions; the other treats of the leased branches, which do not earn their rentals, and thus absorb part of the net earnings of the Main Line, and, this, which we copy below, gives the reasons that determined the Board to make the leases, and lead Mr. Joy to believe that they were on the whole advantageous—having, though resulting in an absolute loss, prevented the company from incurring a greater loss:

"The causes above stated are the main ones which have affected the revenues of the company. There is another, however, which, in a much smaller degree, has affected, up to the present time, and for some time longer, and until there shall be revived prosperity, will somewhat affect them. This is the leased lines—those leased within the last five years. The Joliet & Northern Indiana was leased twenty years ago, and should not now be considered. Those leased within the period named are the Jackson, Lansing & Saginaw, the Grand River Valley, the Kalamazoo & South Haven, and the Michigan Air Line roads. Of these the Air Line road, in itself, never has been, and never will be, profitable. Except as a double track for the Main Line, and to relieve it, this company could not afford to retain it. As a double track, it is as valuable, and perhaps more so, than a double track along the Main Line. It is obtained at a cheaper cost than such a double track could have been built. The business—passenger and freight—could not be done by one main line, and the Air Line is an immense relief to it, in the ease and dispatch with which the business can be done. While, therefore, the Air Line, as an independent road, would be of no value, it is important to this company as its double track for the distance of 115 miles by the old line. It is simply a part of the Main Line, though it has, of course, some, though not a very important, local business, in addition.

"It may be remarked, however, that worthless as it is in itself, as property, and would have been even if the projectors could have carried out their original plan, it failed of becoming another through line across the entire State, solely in consequence of a decision of the Supreme Court of the State, holding that it was not competent for the legislative power to authorize towns, cities and counties to vote aid to construct railroads—a decision at variance with those of all other States, with, perhaps, one exception, and those of the Supreme Court of the United States. It was enough, however, to destroy the value of the large amount of the aid voted for it, and defeat its complete construction.

"The other roads named above were all projected and begun and built by the people along their lines, stimulated, of course, by the large subsidies voted by towns, cities and counties, and realized before the decision alluded to, to aid in their construction. During the long period, from 1850 up to nearly 1865, but little had been done in the construction of railroads in the State. It had progressed rapidly in wealth and population, but had remained nearly stationary so far as this kind of improvement was concerned. The Michigan Southern Company had built a branch to Jackson; but with that exception, the country through which the main line of the Central runs had not been invaded by any other railroads. Its local traffic was, all that time, safe, and its rates not effected by competition, and were well maintained. The time had come, however, when this state of things could no longer continue. The country was really rich and populous, and, especially at the close of the war, numerous railways were projected, which, it was clear, must affect, favorably or otherwise, the interests of this company. All of those above named were among them. Among the first was the Kalamazoo, Allegan & Grand Rapids, and the Jackson, Lansing & Saginaw roads. The first extended from Kalamazoo, by way of Allegan, to Grand Rapids, all important places, and the last the second most important city in the State. Its business was largely with Chicago, and the Central road, from Kalamazoo, is the short road to that city. The road from Kalamazoo to Grand Rapids was to be, apparently, a valuable feeder to the road of this company, and but for the subsequent construction of other roads would have been so. Not long after wards—but after the road between Kalamazoo and Grand Rapids was completed, and the first hundred miles of the Jackson, Lansing & Saginaw had been opened—the Grand River Valley and the Kalamazoo & South Haven were undertaken, and had made considerable progress toward completion. For several years, and up to this time, it remained the purpose of this company not to become connected with those roads or any others, except by such friendly action and offices as, it was supposed, would secure to this road the business to and from those roads, which could be more conveniently done by it, as was thought—certainly as well—as by any other possible connecting line of road. They were all aided by personal subscription to the stock, by people along the lines as well as by municipal assistance; but, being new, still needed aid to their credit in the market for the sale of their bonds. Application was made to the board of this company for such aid, and, after full consideration and discussion, it was agreed to make a traffic contract with them, by which this company agreed to set apart of the earnings upon its own road from business which those tributary roads might send over it a certain percentage, which should be applied each year to buy the bonds of the tributary road in the market; and to give value to such a contract, each company with which it was made, agreed to send all its business which it could control over the Central road where the latter road was the direct road to the seaboard cities or to the West. The contracts so made with each of said companies from time to time, were printed upon the bonds, and they were sold, perhaps largely, upon the faith of it. These contracts imposed no burden upon this company, because the percentage to be so applied was to come from new business created by the lateral road, largely at least. This was the position of things when the Kalamazoo, Allegan & Grand Rapids road had been finished and opened some time. Its bonds had been sold upon the faith of such an agreement printed upon them. The Jackson, Lansing & Saginaw had been opened for a distance of 136 miles.

"Meanwhile the Michigan Southern Company had promoted and aided a railroad (now a part of its Grand Rapids Branch) from Constantine, on its own line, north to Kalamazoo. As soon as this was done, it tempted the company owning the Kalamazoo, Allegan & Grand Rapids road, by offers to take a permanent lease of it on such favorable terms as would give value to its stock. These offers were so allurng that the company yielded to them, made the lease, and the road—whose business had been pledged by contract to the Central road, as above stated—passed into the hands and control of the Michigan Southern Company, and all its business, both east and west, was permanently lost to this company.

"The Grand River Valley, the Jackson, Lansing & Saginaw, and the Kalamazoo & South Haven had progressed well toward completion. Let the reader turn to Map No. 2, appended to this report, and he will note that each of these roads could now be as easily connected, at Jackson and Kalamazoo, with the Michigan Southern as with the Central road. The Kalamazoo & Grand Rapids road had been absorbed by the Southern Company. That company had, soon after, been consolidated with the Lake Shore Railroad Company. The consolidated company had lost none of the disposition and desire of the other, to reach out for and grasp business properly belonging to another company, but, on the contrary, this desire had apparently become intensified by its increased power and ability. Overtures were made in various ways, by parties connected with it, to open negotiations with the companies owning those roads, for their lease or purchase. The business of two of them, at least, was sure, in time, to be large, and, with what would be earned by themselves, and the business they could send over a connecting road, thus swelling its revenues, they were quite certain to become profitable, if not very valuable. It had now become, perhaps, equally dangerous for this company either to have anything further to do with them, or to let them alone to be overcome by temptation, as had been the Kalamazoo, Allegan & Grand Rapids Company. Either alternative was a disagreeable one, and contrary to what had been the policy of the company. But to allow the Grand River Valley road to pass into the control of the Southern Company was not only to allow it to take all its business to Toledo and east by the South Shore road, but also to give it the regulation of all rates on the north as well as the south side of the Central road, which might be even worse than to lose the contribution of $100,000 of business per annum, or nearly so, which, even in these times that road makes to the main line. The same remarks are applicable to the Jackson, Lansing & Saginaw, and, though very much less important, to the Kalamazoo & South Haven road. The business of the last is comparatively unimportant, though not to be judged by these times. That of the other two was sure to be important, and the Jackson, Lansing & Saginaw to increase with time, to great value. They might possibly be burdensome for a time, though it was not so thought; but if once leased to the Lake Shore & Michigan Southern Company, no matter how valuable they might become, they were forever gone, and their business forever turned to Toledo, and over the road of that company. All the advantages and disadvantages were considered. The manner in which the Board regarded them, even then, is stated in the report of 1871, page 10, after the Board had concluded, with much hesitation, that the alternative which was least dangerous was to lease them on the best terms possible, where the following language is used:

"'There are multitudes of projected railroads in this State, and some of them are building; but the Board do not see in any of them anything which should tempt this company to a connection with them. So far as possible, it has controlled those most likely to injure it when built, and which might, if controlled by it, become tributary to it. The policy, even to this extent, and from such motives, may be hazardous, and, whether wise, remains to be proved.'

"There have been now two years of great depression in all classes of business, and, judged by the present, it might be considered that the sharpest horn of the dilemma had been chosen, while an experience of a short time more may, and probably will, prove that it would have been fatal to have chosen the other. In any event there has been no ambitious desire to acquire control of the roads of other companies. It has simply been the purpose to protect, so far as it might, the business properly belonging to your road and prevent it being turned away to other lines, and also, so far as it might, to protect its rates, which was almost equally important. Even this, it will be seen, has been done rather as a choice of evils, and with the hope that the least of two evils was chosen, when both could not be avoided. It may, nevertheless, be stated that the Board considered, and do still consider, the agreement with the Jackson, Lansing & Saginaw, and also with the Grand River Valley companies, of real and substantial value to this company, and were the decision to be made now with regard to them, we should not be willing to advise surrendering them. It is more doubtful about the Kalamazoo & South Haven.

It should perhaps be added that the construction of a railroad from Mackinac to Marquette, not long to be delayed, for which the State has made an appropriation of more than a million and a quarter of acres of land, exempt from taxation for twenty years, will add very largely to the value of the Jackson, Lansing & Saginaw Railroad in itself, aside from the great importance of it as a contributor to the business of the main line.

"With all the anxiety felt to protect the local business of the road, and add to it, as well as to protect its rates, which have been the motive in taking control of roads which could, with equal facility, turn their business over your road or that of the Lake Shore & Michigan Southern Company (and it has leased none other), only partial success has been obtained. So earnestly have local interests promoted the construction of new roads that not only was the Air Line planned across the State, and likely to be built through, but another was also projected, parallel with it, and is nearly completed, viz.: the Chicago & Lake Huron road. This is built from Battle Creek, in the direction of Chicago, parallel with the main line of this company, nearly 80 miles, and distant from it only an average of seven miles. Last of all, and but just before the panic, the Lake Shore & Michigan Southern Company promoted the construction of a new road from Jonesville, on its old line, north to Lansing, across the lines of your road at Homer, Albion and Eaton Rapids, crossing the Air Line, Main Line, and Grand River Valley road. This is the youngest born of the brood of roads calculated to seriously affect both the traffic and the rates of the Michigan Central road. That stockholders may the better appreciate the changes made by these and other cross roads along the main line, two maps have been prepared and published herewith. No. 1 shows the road as it was about ten years since. No. 2 shows it as it is now. The Michigan Southern road touches the main line in three and crosses it in two places; the Pennsylvania system is one, and others at other points. At almost all local points the same competition is created as for through business. The responsibilities of a manager of a railroad property so situated and going through such trials, for the past few years, have not been an agreeable ones. Important and complicated questions, affecting its permanent interests, have arisen and necessarily been acted upon, sometimes requiring instant decision and action; and time alone can determine how wisely or unwisely it has been done. On the whole, it is believed they have been well decided. The great causes which have affected your property are not the lease of this or that lateral road, though temporarily this has had some effect. A little time will remedy all such results from that cause. The matters which have mainly impaired the revenues of the company have been wholly beyond the control of the management. They are largely permanent. But it is now hardly possible that the worst has not been reached. It is now quite certain that the future will be one of increasing revenue, with increase of business. It is also certain that the results of the economies begun and in progress will be much more marked in the next than in the past year. There are, even now, indications of an improvement in several classes of business. Passenger rates, and rates on some classes of freight, have been, or will be, restored. Dissension between great companies, and involving all others in their consequences, will cease. There is promise of abundant harvests in the West. New roads can scarcely again, for many years, be built to injure the old ones. With the natural increase of business, and with only such rates as the condition of things will allow us to realize, but a short time will be required to restore the value of the great lines. It must come mainly from increased business, and not from any considerable increase of rates, though there will be an improvement in them."